

ENVIRONMENTAL ASSESSMENT (EA)

**BIRD DAMAGE MANAGEMENT
IN THE
KENTUCKY WILDLIFE SERVICES PROGRAM**

UNITED STATES DEPARTMENT OF AGRICULTURE (USDA)
ANIMAL AND PLANT HEALTH INSPECTION SERVICE (APHIS)
WILDLIFE SERVICES (WS)

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ACRONYMS

ADC	Animal Damage Control
APHIS	Animal and Plant Health Inspection Service
ARD	Assistant Regional Director
AVMA	American Veterinary Medical Association
BDM	Bird Damage Management
BBS	Breeding Bird Survey
CDFG	California Department Of Fish And Game
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
EA	Environmental Assessment
EEE	Eastern Equine Encephalomyelitis
EIS	Environmental Impact Statement
EJ	Environmental Justice
EPA	U.S. Environmental Protection Agency
ERO	Eastern Regional Office
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FDA	Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FY	Fiscal Year
GPRA	Government Performance Results Act of 1993
IWDM	Integrated Wildlife Damage Management
KAR	Kentucky Administrative Regulations
KDA	Kentucky Department of Agriculture
MIS	Management Information System
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NWRC	National Wildlife Research Center
OSHA	Occupational Safety and Health Administration
SLE	St. Louis Encephalomyelitis
SOP	Standard Operating Procedure
T&E	Threatened and Endangered
TGE	Transmissible Gastroenteritis
USC	United States Code
USDA	U.S. Department of Agriculture
USDC	U.S. Department of Commerce
USDI	U.S. Department of Interior
USGS	U. S. Geological Survey
USFWS	U.S. Fish and Wildlife Services
KDFWR	Kentucky Department of Fish And Wildlife Resources
WEE	Western Equine Encephalomyelitis
WS	Wildlife Services

NOTE: On August 1, 1997, the Animal Damage Control program was officially renamed to Wildlife Services. The terms Animal Damage Control, ADC, Wildlife Services, and WS are used synonymously throughout this Environmental Assessment.

1.1 Introduction

USDA/APHIS/ Wildlife Services (WS) is authorized by Congress to manage a program to reduce human/wildlife conflicts. WS's mission is to "provide leadership in wildlife damage control to protect America's agricultural, industrial and natural resources, and to safeguard public health and safety (USDA 1989)." This is accomplished through:

- training of wildlife damage management professionals;
- development and improvement of strategies to reduce economic losses and threats to humans from wildlife;
- collection, evaluation, and dissemination of management information;
- cooperative wildlife damage management programs;
- informing and educating the public on how to reduce wildlife damage and;
- providing data and a source for limited-use management materials and equipment, including pesticides (USDA 1989).

This Environmental Assessment (EA) evaluates ways by which this responsibility can be carried out to resolve conflicts with bird species in Kentucky.

WS is a cooperatively funded service-oriented program. Before any operational wildlife damage management is conducted, *Agreements for Control* or *WS Work Plans* must be completed by WS and the land owner/administrator. WS cooperates with other Federal, State and Local government entities, private property owners and managers, and with appropriate land and wildlife management agencies, as requested, with the goal of effectively and efficiently resolving wildlife damage problems in compliance with all applicable Federal, State, and Local laws.

Individual actions on the types of sites encompassed by this analysis may be categorically excluded under the APHIS Implementing Regulations for compliance with the National Environmental Policy Act (NEPA) (7 CFR 372.5(c)). APHIS Implementing Regulations also provide that all technical assistance furnished by WS is categorically excluded (7 CFR 372.5(c)) (60 Federal Register 6,000, 6,003 (1995)). Bird damage management is a large component of the Kentucky WS program. Therefore, WS has decided to prepare this EA to assist in planning bird damage management (BDM) activities and to clearly communicate with the public the analysis of cumulative effects for a number of issues of concern in relation to alternative means of meeting needs for such management in the State. This analysis covers WS's plans for current and future BDM actions wherever they might be requested within the State of Kentucky.

1.2 Purpose

The purpose of this EA is to analyze the effects of WS activities in Kentucky to manage damage caused by bird species or species groups that include, but are not necessarily limited to, the following: European starlings (*Sturnus vulgaris*), blackbirds (family Emberizidae, subfamily Icterinae), rock doves or feral domestic pigeons (*Columba livia*), American crows (*Corvus brachyrhynchos*), woodpeckers (family Picidae), geese (family Anatidae, subfamily Anserinae), ducks (family Anatidae, subfamily Anatinae), coots (*Fulica americana*), swallows (family Hirundinidae), house or English sparrows (*Passer domesticus*), raptors (hawks, owls, and vultures; families Falconidea, Accipitridea, Titonidea, Strigidea, and Cathartidea), killdeer (*Charadrius vociferus*), mourning doves (*Zenaida macroura*), and fish-eating birds including double-crested cormorants (*Phalacrocorax auritus*), great blue herons (*Ardea herodias*), and little blue herons (*Egretta caerulea*). Resources protected by such activities include agricultural crops, turf, livestock feed, livestock, livestock health, property, threatened and endangered species, other wildlife, aquaculture, and human health and safety. Hereinafter, blackbirds refers to the blackbird group as described in the FEIS prepared by the WS program (USDA 1994). These include red-winged (*Agelaius phoeniceus*), tricolored (*A. tricolor*), rusty (*Euphagus*

carolinus), Brewer's (*E. cyanocephalus*), and yellow-headed blackbirds (*Xanthocephalus xanthocephalus*), brown-headed cowbirds (*Molothrus ater*), bronzed cowbirds (*Tangavius aeneus*), great-tailed grackles (*Cassidix mexicanus*), and common grackles (*Quiscalus quiscula*).

1.3 Need For Action

1.3.1 Summary of Proposed Action

The proposed action is to continue the current portion of the WS program in Kentucky that responds to requests for BDM to protect human health and safety, agricultural crops, turf, livestock feed, livestock, livestock health, property, threatened and endangered species, and other wildlife, and aquaculture in the State of Kentucky. A major component of BDM in the Kentucky WS program has the goal of minimizing human health and safety threats and property damage in urban environments. Primary species of concern related to damage in urban environments are feral domestic pigeons, European starlings / blackbirds, English sparrows and waterfowl. The program would also operate to reduce loss or the risk of loss of agricultural crops and to reduce or minimize the loss of livestock feed and the risk of bird-related livestock health problems presented by European starling / blackbirds, and Canada geese (*Branta canadensis*), at requesting dairies, feedlots, and poultry operations, and to meet requests to minimize damage or the risk of damage to other agriculture, other wildlife species, property, human health and safety, or other resources caused by birds. To meet these goals WS would have the objective of responding to all requests for assistance with, at a minimum, technical assistance or self-help advice, or, where appropriate and when cooperative or congressional funding is available, direct control assistance in which professional WS Specialists conduct damage management actions. An Integrated Wildlife Damage Management (IWDM) approach would be implemented which would allow use of any legal technique or method, used singly or in combination, to meet requester needs for resolving conflicts with birds. Agricultural producers and others who request assistance would be provided with information regarding the use of effective nonlethal and lethal techniques. Lethal methods used by WS could include shooting, trapping, egg addling / destruction, DRC-1339, also called Starlicide (3-chloro-p-toluidine hydrochloride), Avitrol (4-aminopyridine), or euthanasia following live capture by trapping or use of the tranquilizer alpha-chloralose (A-C). Nonlethal methods used by WS could include porcupine wire deterrents, wire barriers and deterrents, netting, live capture and translocation using the tranquilizer A-C, chemical repellents (e.g., methyl anthranilate, di-methyl anthranilate, or anthraquinone), and harassment. In many situations, the implementation of nonlethal methods such as exclusion-type barriers would be the responsibility of the requester to implement. BDM by WS would be conducted in the State, when requested, on private property sites or public facilities where a need has been documented, upon completion of an *Agreement for Control*. All management actions would comply with appropriate Federal, State, and Local laws. In addition, all individual actions would be analyzed to make sure that they are covered by this document.

1.3.2 Need For Bird Damage Management to Protect Human Health and Safety

Feral domestic pigeons and European starlings have been suspected in the transmission of 29 different diseases to humans, (Davis et.al. 1971, and Weber 1979). These include viral diseases such as meningitis and seven different forms of encephalitis; bacterial diseases such as erysipeloid, salmonellosis, paratyphoid, Pasteurellosis, and Listeriosis; mycotic (fungal) diseases such as aspergillosis, blastomycosis, candidiasis, cryptococcosis, histoplasmosis, and sarcosporidiosis; protozoal diseases such as American trypanosomiasis and toxoplasmosis; and rickettsial/chlamydial diseases such as chlamydiosis and Q fever. As many as 65 different diseases transmittable to humans

or domestic animals have been associated with pigeons, European starlings, and English sparrows (Weber 1979). Table 1-1 shows the more typical diseases affecting humans that can be transmitted by pigeons and European starlings. In most cases in which human health concerns are a major reason for requesting BDM, no actual cases of bird transmission of disease to humans have been proven to occur. Thus, it is the risk of disease transmission that is the primary reason for requesting and conducting BDM. Situations in Kentucky where the threat of disease associated with European starling, feral domestic pigeon, or English sparrow populations might occur could be:

- exposure by residents to a European starling roost which has been in a residential area for more than three years
- disturbance of a large deposit of droppings in an attic where a flock of feral domestic pigeons routinely roosts or nests
- accumulated droppings from roosting European starlings, feral domestic pigeons, or English sparrows on structures at an industrial site where employees must work in areas of accumulation
- English sparrows or European starlings nesting or loafing around a food court area of a recreational facility or other site where humans eat in close proximity to concentrated numbers of these birds

In Kentucky, American crows form large communal roosts of the kind associated with disease organisms which grow in soils enriched by bird excrement, such as *Histoplasma capsulatum* (Weeks and Stickley 1984). Sometimes, such roosts occur in urban environments. Public health officials and residents at such sites express concerns for human health related to the potential for disease transmission where dropping deposits accumulate. WS receives requests for assistance in resolving problems related to large urban crow roosts in Kentucky.

Many times, individuals or property owners that request assistance with feral domestic pigeon, American crow, or nuisance blackbird or European starling roost problems are concerned about potential disease risks but are unaware of the types of diseases that can be associated with these birds. In most such situations, BDM is requested because the mess associated with droppings left by concentrations of birds is aesthetically displeasing and can result in continual clean-up costs. Under the proposed action, WS could agree to assist in resolving these types of problems.

WS could provide operational BDM involving virtually any bird species that poses a threat to human health and safety to any requester experiencing such damage anywhere in Kentucky.

Table 1-1. Information On Some Diseases Transmissible To Humans And Livestock That Are Associated With Feral Domestic Pigeons, European Starlings, And English Sparrows. Information Taken From Weber (1979)

Disease	Human Symptoms	Potential for Human Fatality	Effects on Domestic Animals
Bacterial:			
erysipeloid	skin eruption with pain, itching; headaches, chills, joint pain, prostration, fever, vomiting	sometimes - particularly to young children, old or infirm people	serious hazard for the swine industry

salmonellosis	gastroenteritis, septicaemia, persistent infection	possible, especially in individuals weakened by other disease or old age	causes abortions in mature cattle, possible mortality in calves, decrease in milk production in dairy cattle
Pasteurellosis	respiratory infection, nasal discharge, conjunctivitis, bronchitis, pneumonia, appendicitis, urinary bladder inflammation, abscessed wound infections	rarely	may fatally affect chickens, turkeys and other fowl
Listeriosis	conjunctivitis, skin infections, meningitis in newborns, abortions, premature delivery, stillbirth	sometimes - particularly with newborns	In cattle, sheep, and goats, difficulty swallowing, nasal discharge, paralysis of throat and facial muscles
Viral:			
meningitis	inflammation of membranes covering the brain, dizziness, and nervous movements	possible — can also result as a secondary infection with listeriosis, salmonellosis, cryptococcosis	causes middle ear infection in swine, dogs, and cats
encephalitis (7 forms)	headache, fever, stiff neck, vomiting, nausea, drowsiness, disorientation	mortality rate for eastern equine encephalomyelitis may be around 60%	may cause mental retardation, convulsions and paralysis
Mycotic (fungal):			
aspergillosis	affects lungs and broken skin, toxins poison blood, nerves, and body cells	not usually	causes abortions in cattle
blastomycosis	weight loss, fever, cough, bloody sputum and chest pains.	rarely	affects horses, dogs and cats
candidiasis	infection of skin, fingernails, mouth, respiratory system, intestines, and urogenital tract	rarely	causes mastitis, diarrhea, vaginal discharge and aborted fetuses in cattle
cryptococcosis	lung infection, cough, chest pain, weight loss, fever or dizziness, also causes meningitis	possible especially with meningitis	chronic mastitis in cattle, decreased milk flow and appetite loss
histoplasmosis	pulmonary or respiratory disease. May affect vision	possible, especially in infants and young children or if disease disseminates to the blood and bone marrow	actively grows and multiplies in soil and remains active long after birds have departed
Protozoal:			
American trypanosomiasis	infection of mucous membranes of eyes or nose, swelling	possible death in 2-4 weeks	caused by the conenose bug found on pigeons

toxoplasmosis	inflammation of the retina, headaches, fever, drowsiness, pneumonia, strabismus, blindness, hydrocephalus, epilepsy, and deafness	possible	may cause abortion or still birth in humans, mental retardation
Rickettsial /Chlamydial:			
chlamydiosis	pneumonia, flu-like respiratory infection, high fever, chills, loss of appetite, cough, severe headaches, generalized aches and pains, vomiting, diarrhea, hepatitis, insomnia, restlessness, low pulse rate	occasionally, restricted to old, weak or those with concurrent diseases	in cattle, may result in abortion, arthritis, conjunctivitis, and enteritis
Q fever	sudden pneumonitis, chills, fever, weakness, severe sweating, chest pain, severe headaches and sore eyes	possible	may cause abortions in sheep and goats

1.3.3 Need For Bird Damage Management at Airports

The risk that birds pose to aircraft is well documented with the worst case reported in Boston in 1960 when 62 people were killed in the crash of an airliner which collided with a flock of European starlings (Terres 1980). In fiscal year (FY) 1996, Canada geese were struck by an Air Force AWACS plane in Elmendorf Alaska, causing the death of 24 airmen when the plane crashed. In addition a \$190 million plane was lost (Dolbeer 1997). Again, in 1999, a Boeing 757 struck a flock of European starlings at the Cincinnati / Northern Kentucky International Airport and was forced to abort the flight (NTSB 1999). Damages were assessed at more than \$500,000 by airport officials (D.T. Little, WS Pers. Comm. 1999).

WS receives several requests annually for assistance regarding bird damage management at airports in Kentucky. These requests are considered serious because of the potential for loss of human life and because damage to aircraft can be extremely expensive. WS could provide operational BDM involving virtually any bird species that poses a strike hazard at the request of any aviation facility in the State.

1.3.4 Need for Bird Damage Management at Cattle Feeding and Dairy Cattle Facilities

Blackbirds, European starlings, English sparrows, and, to a lesser extent, feral domestic pigeons and American crows often cause damage at cattle feeding facilities and dairies by congregating in large numbers to feed on the grain component of cattle feed. Such feeding strategies present disease threats to livestock at such sites (Table 1-2). The birds also cause damage by defecating on fences, shade canopies, and other structures, which can accelerate corrosion of metal components and which generally is considered an unsightly nuisance and potential health hazard for the feedlot/dairy operators and their personnel.

Contribution of Livestock and Dairies to the Economy. Livestock and dairy production in Kentucky contribute substantially to local economies. In 1998 Kentucky feedlots maintained 2,555,000 cattle and calves valued at \$1.3 billion. There were 140,000 milk cows valued at \$68.6 million in the State,

and Kentucky's dairy operators produced 1.7 billion pounds of milk generating \$243 million in producer gross income (Kentucky Agricultural Statistics Service 1999).

Scope of Livestock Feed Losses. The problem of starling damage to livestock feed has been documented in France and Great Britain (Feare 1984), and in the United States (Besser et al. 1968). The concentration of larger numbers of cattle eating huge quantities of feed in confined pens results in a tremendous attraction to European starlings, blackbirds, and feral domestic pigeons. Diet rations for cattle contain all of the nutrients and fiber that cattle need, and are so thoroughly mixed that cattle are unable to select any single component over others. The basic constituent of most rations is silage and the high energy portion is usually provided as barley, which may be incorporated as whole grain, crushed, or ground cereal. While cattle cannot select individual ingredients from that ration, European starlings can and do select the barley, thereby altering the energetic value of the complete diet. The removal of this high energy fraction by European starlings, is believed to reduce milk yields, weight gains, and is economically critical (Feare 1984). Glahn and Otis (1986) reported that starling damage was also associated with proximity to roosts, snow, and freezing temperatures and the number of livestock on feed.

The economic significance of feed losses to European starlings has been demonstrated by Besser et al. (1968) who concluded that the value of losses in feedlots near Denver, Colorado was \$84 per 1,000 birds in 1967. Forbes (1995) reported European starlings consume up to 50% of their body weight in feed each day. Glahn and Otis (1981) reported losses of 4.8 kg of pelletized feed consumed per 1,000 bird minutes. Glahn (1983) reported that 25.8% of farms in Tennessee experienced starling depredation problems of which 6.3% experienced considerable economic loss. Williams (1983) estimated seasonal feed losses to five species of blackbirds (primarily brown-headed cowbirds) at one feedlot in south Texas at nearly 140 tons valued at \$18,000.

BDM at feedlots and dairies has been a very minor component of the Kentucky WS program. Despite the size of the cattle feedlot and dairy industries in Kentucky, WS provided operational BDM assistance in response to only five requests for assistance at such facilities during the 3-year period of FY 96 through FY 98. The reasons for the low numbers of requests in Kentucky are not entirely clear but several possible reasons are (1) relatively lower numbers of wintering blackbirds and European starlings in the major areas where feedlots/dairies occur in the State compared to other areas of the country, (2) more availability of natural foods because of lack of snow cover compared to more northern areas where bird damage is more severe (Besser et al. 1968), and (3) the number of dairies and feedlots in the State is perhaps high enough that bird damage is spread over many facilities so that few individual facilities experience intolerable bird levels. Despite the minor nature of this type of BDM in Kentucky, the dairy industry is substantial in the State, and requests for BDM could increase in the future.

An example of damage through effects on livestock operations caused by birds occurred in a large cattle feeding operation in the panhandle of Texas. Trained WS field personnel determined that this operation had an estimated 1,000,000 blackbirds and European starlings using the facility per day. The operators had a similar facility that did not have bird damage problems. They reported that, based on a comparison of feed losses, livestock health problems (primarily coccidiosis), and water trough maintenance costs (continuous labor costs for cleaning bird droppings out of water troughs), bird damage was costing them about \$5,000/day (R. Smith, WS, Canyon District, TX, pers. comm.).

Scope of Livestock Health Problems. A number of diseases that affect livestock have been associated with feral domestic pigeons, European starlings, blackbirds, and English sparrows (Weber 1979).

Transmission of diseases such as Transmissible Gastroenteritis Virus (TGE), Tuberculosis (TB), and Coccidiosis to livestock has been linked to migratory flocks of European starlings and blackbirds. Estimates of the dollar value of this type of damage are not available. A consulting veterinarian for a large cattle feeding facility in Texas indicated problems associated with coccidiosis declined following reduction of starling and blackbird numbers using the facility (R. Smith, WS, Canyon District, TX, pers. comm.).

Table 1-2 summarizes some diseases associated with European starlings, blackbirds, feral domestic pigeons, and English sparrows. The table also summarizes types of livestock affected, typical symptoms and comments regarding implications for the listed diseases.

1.3.5 Need For Canada Goose Damage Management to Protect Agriculture

Canada goose populations are at a record high in Kentucky with estimated resident populations of more than 46,000 in 1999 (R. Pritchert, KDFWR Pers. Comm. 2000). Geese rely on a variety of agricultural crops such as wheat, corn, and cereal crops. These birds feed on waste grain in harvested fields during late fall and winter and little damage results from these activities. However, in addition to feeding on grain, young shoots of agricultural crops and grasses are favored by them. As a result, winter wheat is sometimes heavily damaged by feeding birds, as is early spring crops, and pasture lands. On the other hand, some information suggests that such damage may be partially offset by the effect that droppings left by these birds has on increasing the nitrogen content of crop soils and thus enhancing yields (Bell and Klimstra 1970). In the United States, legal hunting has proven successful in mitigating damage to crops in some instances (W.K. Pfeifer, 1983).

Table 1-2. Some Diseases Of Livestock That Have Been Linked To Feral Domestic Pigeons, European Starlings, Blackbirds, And/Or English Sparrows. Information From Weber (1979).

Disease	Livestock affected	Symptoms	Comments
Bacterial:			
erysipeloid	cattle, swine, horses, sheep, goats, chickens, turkeys, ducks	Pigs - arthritis, skin lesions, necrosis, septicemia Sheep - lameness	serious hazard for the swine industry, rejection of swine meat at slaughter due to septicemia, also affects dogs
salmonellosis	all domestic animals	abortions in mature cattle, mortality in calves, decrease in milk production in dairy cattle Colitis in pigs,	over 1700 serotypes
Pasteurellosis	cattle, swine, horses, rabbits, chickens, turkeys	Chickens and turkeys die suddenly without illness pneumonia, bovine mastitis, abortions in swine, septicemia, abscesses	also affects cats and dogs
avian tuberculosis	chickens, turkeys, swine, cattle, horses, sheep	Emaciation, decrease in egg production, and death in poultry. Mastitis in cattle	also affects dogs and cats
Streptococcosis	cattle, swine, sheep, horses, chickens, turkeys, geese, ducks, rabbits	Emaciation and death in poultry. Mastitis in cattle, abscesses and inflammation of the heart, and death in swine	feral pigeons are susceptible and aid in transmission

yersinosis	cattle, sheep, goats, horses, turkeys, chickens, ducks	abortion in sheep and cattle	also affects dogs and cats
vibriosis	cattle and sheep	In cattle, often a cause of infertility or early embryonic death. In sheep, the only known cause of infectious abortion in late pregnancy	of great economic importance
Listeriosis	Chickens, ducks, geese, cattle, horses, swine, sheep, goats	In cattle, sheep, and goats, difficulty swallowing, nasal discharge, paralysis of throat and facial muscles	also affects cats and dogs
Viral:			
meningitis	cattle, sheep, swine, poultry	inflammation of the brain, newborn calves unable to suckle	associated with listeriosis, salmonellosis, cryptococcosis
encephalitis (7 forms)	horses, turkeys, ducks	drowsiness, inflammation of the brain	mosquitos serve as vectors
Mycotic (fungal):			
aspergillosis	cattle, chickens, turkeys, and ducks	abortions in cattle	common in turkey poults
blastomycosis	weight loss, fever, cough, bloody sputum and chest pains.	Rarely	affects horses, dogs and cats
candidiasis	cattle, swine, sheep, horses, chickens, turkeys	In cattle, mastitis, diarrhea, vaginal discharge, and aborted fetuses	causes unsatisfactory growth in chickens
cryptococcosis	cattle, swine, horses	chronic mastitis in cattle, decreased milk flow and appetite loss	also affects dogs and cats
histoplasmosis	horses cattle and swine	(in dogs) chronic cough, loss of appetite, weakness, depression, diarrhea, extreme weight loss	also affects dogs; actively grows and multiplies in soil and remains active long after birds have departed
Coccidiosis	poultry, cattle, and sheep	bloody diarrhea in chickens, dehydration, retardation of growth	almost always present in English sparrows; also found in pigeons and European starlings
Protozoal:			
American trypanosomiasis	infection of mucous membranes of eyes or nose, swelling	possible death in 2-4 weeks	caused by the conenose bug found on pigeons
toxoplasmosis	cattle, swine, horses, sheep, chickens, turkeys	In cattle, muscular tremors, coughing, sneezing, nasal discharge, frothing at the mouth, prostration and abortion	also affects dogs and cats
Rickettsial/Chlamydial:			

chlamydiosis	cattle, horses, swine, sheep, goats, chickens, turkeys, ducks, geese	In cattle, abortion, arthritis, conjunctivitis, enteritis	also affects dogs and cats and many wild birds and mammals
Q fever	affects cattle, sheep, goats, and poultry	may cause abortions in sheep and goats	can be transmitted by infected ticks

1.3.5.1 Management of Damage Threats By Canada Geese To Poultry Operations In Kentucky

Threats to the health of poultry in large operations throughout central and western Kentucky have become a very important issue during the past five years. This industry has expanded greatly in the State during a period when populations of resident Canada geese have likewise increased. During 1998, poultry and egg production operations in Kentucky resulted in \$385 million in gross income through the production of 863 million eggs and 842,800 pounds of poultry. Canada geese frequent retention ponds which play a role in waste processing at these facilities. Employees maintaining pond areas can accidentally transfer goose droppings on their shoes into buildings where poultry are housed. This results in exposing the poultry to infectious disease organisms such as streptococcosis or listeriosis which are sometimes carried by free roaming waterfowl.

Although WS has provided only technical assistance in only two instances involving damage threats by Canada geese to poultry operations in Kentucky, requests for assistance are expected to increase as this industry grows and as populations of Canada geese increase in the State.

1.3.5.2 Management Of Canada Goose Damage To Other Agricultural Resources

Canada geese are found in Kentucky throughout the year and must constantly seek adequate food. They cause damage to crops and pastures throughout the State. WS occasionally receives requests for assistance with these problems. Most of these problems are addressed by WS through technical assistance which involves advice and loaning or sale of nonlethal bird scaring equipment and materials.

1.3.6 Need For Other Bird Damage Management Related To Agricultural Crops

Several studies have shown that blackbirds and European starlings can pose a great economic threat to agricultural producers (Besser et. al. 1968, Dolbeer et.al. 1978, and Feare 1984). Fruit or nut crops, especially pecans, can be severely damaged by blackbirds, American crows, and ravens. Bird damage to crops has occasionally been identified as a major problem in the State. In one instance, USDA-Extension Service (D. Simpson USDA, Pers. Comm. 1998) and local farmers reported having to abandon the cultivation of milo in Muhlenberg County as a result of severe losses to blackbird flocks which roosted in a nearby wetland. WS investigated the site and estimated more than one million birds roosted in a large cattail (*Typha* sp.) and *Phragmites* sp. wetland in the Little Cypress Creek drainage during 1998.

Other damage incidents have occurred in various locations in Kentucky. In two incidents investigated by WS, Canada geese damaged young corn in three counties in Kentucky. Costs to one farmer for replanting and yield losses exceeded \$7,000 during one season. Damage to agricultural crops by all bird species reported to WS by the public during FY 1997-99 averaged \$14,050 per year (USDA-WS MIS Database).

1.3.7 Need for Bird Damage Management to Protect Property

Birds frequently damage structures on private property, or public facilities, with fecal contamination. Accumulated bird droppings can reduce the functional life of some building roofs by 50% (Weber 1979). Woodpeckers sometimes cause structural damage to wood siding and stucco on homes. Corrosion damage to metal structures and painted finishes, including those on automobiles, can occur because of uric acid from bird droppings. Electrical utility companies frequently have problems with birds causing power outages by shorting out transformers and substations. Persons and businesses concerned about these types of damage may request WS assistance. The total value of property damage by birds reported to WS in Kentucky for the three-year period of FY 1997 - 99 was more than two million dollars with the annual average being \$695,000. This included property damage reported for aircraft, residential and non-residential buildings, general property, and other human property (USDA-WS MIS Database).

Feral domestic and wild waterfowl sometimes congregate at golf courses, parks, other recreational areas, and business complexes that have ponds or watercourses and cause damage by grazing on turf and by deposition of droppings. In Kentucky, WS responded to 126 requests for assistance during FY 1997-99 to address \$133,214 in damage caused by waterfowl at various facilities. Damage included \$46,719 in damages at golf courses and \$86,495 in damages to other facilities (USDA-WS MIS Database). Economic damage has been in the form of cleanup of parking lots, retention ponds, sidewalks, patios, and lawns at business, residential and recreational locations. At golf courses, costs have been associated with restoration of greens and other turf areas, cleanup of human use areas, and lost revenue from loss of memberships. Members and the club's management were also concerned about possible health hazards from exposure to the droppings. WS has provided technical assistance to these facilities, and operational BDM assistance to live capture and translocate offending waterfowl. WS could be requested to provide BDM assistance on any of these types or similar damage situations in the State.

1.3.8 Need For Bird Damage Management to Protect Aquaculture.

Aquaculture in Kentucky consists of both commercial fish production for the consumer market by private industry, and sport fish production in hatcheries operated by KDFWR and the USFWS. The commercial aquaculture industry has recently begun to develop in Kentucky producing more than one million dollars in cash receipts from farm marketings in 1998 (Kentucky Agricultural Statistics, 1999). In the past two years the Kentucky Department of Agriculture (KDA) provided \$780,000 of additional funding for the further expansion of commercial aquaculture in the State. In addition, the Kentucky legislature directed the organization of an Aquaculture Task Force to explore ways to further fund aquaculture for the purpose of developing the industry in the State. As an outcome of the Task Force findings the legislature further voted to set aside \$4 million for new aquaculture development during the next four years (J. Mansfield, Kentucky Dep. Agri., Pers. Comm., 2000).

Sometimes fish-eating birds such as various species of herons and egrets (order *Ciconiiformes*, family *Ardeidae*), double-crested cormorants (*Phalacrocorax auritus*), herring gulls (*Larus argentatus*), ring-billed gulls (*Larus delawarensis*), ospreys (*Pandion haliaetus*), and others prey on young fry and fingerlings, adult fish ready for stocking or sale, or brood fish at these fish rearing facilities (Salmon and Conte, 1981 and Schaeffer 1992). Two KDFWR hatcheries recently reported damage which occurred between 1992-98 of more than \$133,000 from fish-eating birds, principally cormorants. Although not a widespread problem in the State, WS could be requested to assist in resolving such problems. In most cases like these, WS only provides advice (technical assistance) to the facility

operators on how to resolve such problems through primarily nonlethal means such as barrier/deterrent wires or harassment. In some cases, the facility might need to obtain a depredation permit from the USFWS to kill a few of the birds to reinforce noise harassment. Under the proposed action, WS could also be requested to provide on-site operational assistance involving the use of nonlethal and lethal means of resolving bird damage problems at these or similar facilities. Lethal methods would generally be restricted to taking only a few birds to reinforce harassment.

1.3.9 Need For Bird Damage Management to Protect Wildlife Including T&E Species

Some of the species listed as threatened or endangered under the Endangered Species Act of 1973 are preyed upon or otherwise adversely affected by certain bird species. For example, juvenile peregrine falcons (*Falco peregrinus*) being reintroduced from an electrical power plant in Mercer County were preyed upon by great-horned owls (*Bubo virginianus*). KDFWR, who was conducting the reintroduction program reported the loss of three birds to owls. Damage costs exceeded \$4,000. WS provided technical assistance to KDFWR for developing a damage management project to protect these birds from depredations. Although peregrine falcons are now removed from the endangered species list, they are still considered a prized natural resource. In addition, other endangered species could be jeopardized by birds in Kentucky. WS may be asked to assist in managing such damage. For instance, brood parasitism by brown-headed cowbirds has become a concern for most wildlife professionals where these birds are plentiful. With endangered bird species, such parasitism can cause enough nest failures to jeopardize the host species. Other instances where WS was requested to assist in developing programs to safeguard the survival of endangered species include protection of piping plover nests from depredating gulls in New York (J. Sillings WS, Pers. Comm. 1994), protection of adult and young least terns in California from depredations by bird and mammalian predators, and protection of desert tortoises from raven depredations in California and Utah, (G. Simmons WS, Pers. Comm. 1999). The red-cockaded woodpecker, an endangered species in Kentucky, suffers damage from pileated, hairy, downy, red-headed and red-bellied woodpeckers, and is suspected of falling prey to Cooper's and sharp-shinned hawks in the State, and damage abatement activities have been initiated in relation to the presence of all the aforementioned species by U. S. Forest Service personnel (L. Penry, U. S. Forest Serv., Pers. Comm., 2000). Although WS has not conducted damage management activities related to this endangered species, such activities might be requested.

The above are just a few examples of BDM activities that WS could conduct under the proposed action to protect other wildlife species. In most cases, if such work is requested by another Federal agency, NEPA responsibility rests with that agency. WS could, however, agree to prepare NEPA documentation for such activities if requested by the other Federal agency.

1.4 RELATIONSHIP OF THIS ENVIRONMENTAL ASSESSMENT TO OTHER ENVIRONMENTAL DOCUMENTS

WS has issued a Final Environmental Impact Statement (FEIS) on the national APHIS/WS program (USDA 1994). This EA is tiered to the FEIS, and pertinent information available in the FEIS has been incorporated by reference into this EA.

1.5 DECISION TO BE MADE

Based on the scope of this EA, the decisions to be made are:

- Should BDM as currently implemented by the WS program be continued in the State?
- If not, how should bird damage in the State be managed and what role should WS play in this?
- Might the continuing of WS's current program of BDM have significant effects requiring preparation of an EIS?

1.6 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

1.6.1 Actions Analyzed

This EA evaluates bird damage management by WS to protect human health and safety, agricultural crops, turf, livestock feed, livestock, livestock health, property, threatened and endangered species, other wildlife, other natural resources, and aquaculture on private land or public facilities within the State wherever such management is requested from the WS program.

1.6.2 Period for Which this EA is Valid

This EA will remain valid until WS determines that new needs for action or new alternatives having different environmental effects must be analyzed. WS monitoring procedures direct that State or Station Directors within the agency assure that each EA for which they are responsible, the Decision associated with the EA, and the activities specified in the Decision will be reviewed annually for applicability and accuracy of the documents, monitoring compliance, and the need for further analysis and documentation due to new information or changes in activities. A report of this review is prepared and filed in the respective State or Station WS office and with the appropriate WS Regional Director. Results of the review and monitoring report will be noticed to the public, including the affected interests within five years of the Decision date for any EA's analyzing ongoing projects. This process insures that each EA is complete and still appropriate to the scope of the State BDM activities.

1.6.3 Site Specificity

This EA analyzes potential effects of WS's BDM activities that will occur or could occur at private property sites or at public facilities within any of the 120 Kentucky counties. Because the proposed action is to continue the current program, and because the current program's goal and responsibility are to provide service when requested within the constraints of available funding and personnel, it is conceivable that BDM activity by WS could occur anywhere in the State. Thus, this EA analyzes the potential effects of such efforts wherever and whenever they might occur as part of the current program. The EA emphasizes important issues as they relate to specific areas whenever possible. However, the issues that pertain to the various types of bird damage and resulting management are the same, for the most part, wherever they occur, and are treated as such. The standard WS Decision Model (Slate et al. 1992) and WS Directive 2.105 is the routine thought process that is the site-specific procedure for determining methods and strategies to use or recommend for individual actions conducted by WS in the State (See USDA 1994, Chapter 2 and Appendix N for a more complete description of the WS Decision Model and examples of its application). Decisions made using this thought process will be in accordance with any mitigation measures and standard operating procedures described herein and adopted or established as part of the decision.

1.7 AUTHORITY AND COMPLIANCE

1.7.1 Authority of Federal and State Agencies in Bird Damage Management in Kentucky¹

1.7.1.1 WS Legislative Authorities

The primary statutory authority for the WS program is the Animal Damage Control Act of 1931 (7 U.S.C. 426-426c; 46 Stat. 1468), which provides that:

The Secretary of Agriculture is authorized and directed to conduct such investigations, experiments, and tests as he may deem necessary in order to determine, demonstrate, and promulgate the best methods of eradication, suppression, or bringing under control on national forests and other areas of the public domain as well as on State, Territory or privately owned lands of mountain lions, wolves, coyotes, bobcats, prairie dogs, gophers, ground squirrels, jackrabbits, brown tree snakes and other animals injurious to agriculture, horticulture, forestry, animal husbandry, wild game animals, furbearing animals, and birds, and for the protection of stock and other domestic animals through the suppression of rabies and tularemia in predatory or other wild animals; and to conduct campaigns for the destruction or control of such animals. Provided that in carrying out the provisions of this Section, the Secretary of Agriculture may cooperate with States, individuals, and public and private agencies, organizations, and institutions."

Since 1931, with the changes in societal values, WS policies and programs place greater emphasis on the part of the Act discussing "bringing (damage) under control," rather than "eradication" and "suppression" of wildlife populations. In 1988, Congress strengthened the legislative authorities of WS with the Rural Development, Agriculture, and Related Agencies Appropriations Act. This Act states, in part:

"That hereafter, the Secretary of Agriculture is authorized, except for urban rodent control, to conduct activities and to enter into agreements with States, Local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammal and bird species that are reservoirs for zoonotic diseases, and to deposit any money collected under any such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control activities."

1.7.1.2 Kentucky Department Of Fish And Wildlife Resources (KDFWR)

The KDFWR is responsible under Kentucky Revised Statute (KRS) 150 Title XII initiated by Acts 1952 ch. 200 for managing most wildlife species in the State under the direction of the Kentucky State Game Commission. KRS 150.320 prohibits the taking of any wild bird except game bird or live raptors for which there is an open season. The statute does not, however, protect or in any way limit the taking of the crow, the starling, or the English sparrow. There are, however, both Federal and Kentucky State statutes which regulate the take of crows for sport. The Migratory Bird Treaty Act of 1918 (MBTA) directs that seasons for the sport take of crows must be limited to 124 days each year and must be held outside the prime breeding season. In Kentucky, 301 KAR 2:260 sets dates for the

¹ See Chapter I of USDA (1994) for a complete discussion of Federal laws pertaining to WS.

taking of crows, but allows for the take of depredating crows anytime. It does not permit the use of calls, blinds or decoys except during the sport-hunting season. The KDFWR issues WS a nuisance wildlife control permit (Appendix C) which allows the take of State-protected bird species for depredation purposes. In addition, the KDFWR participates with WS and a number of State agencies in a Memorandum of Understanding whereby participating agencies have agreed to collaborate in resolving wildlife damage issues (Appendix D).

1.7.1.3 U.S. Fish and Wildlife Service (USFWS)

The USFWS is responsible for managing and regulating take of bird species that are listed as migratory under the MBTA and those that are listed as threatened or endangered under the Endangered Species Act. Sections 1.7.2.2 and 1.7.2.3 below describe WS's interactions with the USFWS under these two laws.

1.7.2 Compliance With Other Federal Laws

Several other Federal laws authorize, regulate, or otherwise affect WS wildlife damage management. WS complies with these laws, and consults and cooperates with other agencies as appropriate.

1.7.2.1 National Environmental Policy Act (NEPA)

WS prepares analyses of the environmental effects of program activities to meet procedural requirements of this law. This EA meets the NEPA requirement for the proposed action in Kentucky. When WS operational assistance is requested by another Federal agency, NEPA compliance is the responsibility of the other Federal agency. However, WS could agree to complete NEPA documentation at the request of the other Federal agency.

1.7.2.2 Endangered Species Act (ESA)

It is Federal policy, under the ESA, that all Federal agencies will seek to conserve threatened and endangered (T&E) species, and will utilize their authorities in furtherance of the purposes of the Act (Sec.2(c)). WS conducts Section 7 consultations with the U.S. Fish & Wildlife Service (USFWS) to use the expertise of the USFWS to ensure that *"any action authorized, funded or carried out by such an agency . . . is not likely to jeopardize the continued existence of any endangered or threatened species . . . Each agency will use the best scientific and commercial data available"* (Sec.7(a)(2)). WS obtained a Biological Opinion (B.O.) from USFWS in 1992 describing potential effects on T & E species, and prescribing reasonable and prudent measures for avoiding jeopardy (USDA 1994, Appendix F). WS initiated formal consultation with the USFWS on several species not covered by the 1992 B.O. and the results of that consultation are pending. In addition, WS is in the process of initiating formal consultation at the programmatic level to reevaluate the 1992 B.O. and to fully evaluate potential effects on T&E species listed or proposed for listing since the 1992 FWS B.O.

1.7.2.3 Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-711; 40 Stat. 755), as Amended

The Migratory Bird Treaty Act (MBTA) provides the USFWS regulatory authority to protect families of birds that contain species which migrate outside the United States. The law prohibits any *"take"* of these species by any entities, except as permitted by the USFWS; therefore, the USFWS issues permits to requesters for reducing bird damage.

WS provides on-site assessments for persons experiencing migratory bird damage to obtain information on which to base damage management recommendations. Damage management recommendations could be in the form of technical assistance or operational assistance. In severe cases of bird damage, WS provides recommendations to the USFWS for the issuance of depredation permits to private entities or other agencies. The ultimate responsibility for issuing such permits rests with the USFWS. European starlings, feral domestic pigeons, English sparrows and domestic waterfowl are not classified as protected migratory birds and therefore have no protection under this Act. USFWS depredation permits are also not required to kill yellow-headed, red-winged, rusty, and Brewer's blackbirds, cowbirds, all grackles, crows, and magpies found committing or about to commit depredation upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance (50 CFR 21.43).

1.7.2.4 Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

FIFRA requires the registration, classification, and regulation of all pesticides used in the United States. The Environmental Protection Agency (EPA) is responsible for implementing and enforcing FIFRA. All chemical methods used or recommended by the WS program in Kentucky are registered with and regulated by the EPA and KDA and are used by WS in compliance with labeling procedures and requirements.

1.7.2.5 National Historic Preservation Act (NHPA) of 1966 As Amended

The National Historic Preservation Act (NHPA) of 1966, and its implementing regulations (36 CFR 800), requires Federal agencies to: 1) determine whether activities they propose constitute "undertakings" that can result in changes in the character or use of historic properties and, 2) if so, to evaluate the effects of such undertakings on such historic resources and consult with the State Historic Preservation Office regarding the value and management of specific cultural, archaeological and historic resources, and 3) consult with appropriate American Indian Tribes to determine whether they have concerns for traditional cultural properties in areas of these Federal undertakings. WS actions on tribal lands are only conducted at the tribe's request and under signed agreement; thus, the tribes have control over any potential conflict with cultural resources on tribal properties. WS activities as described under the proposed action do not cause ground disturbances nor do they otherwise have the potential to markedly affect visual, audible, or atmospheric elements of historic properties and are thus not undertakings as defined by the NHPA. BDM could benefit historic properties if such properties were being damaged by birds. In those cases, the officials responsible for management of such properties would make the request and would have decision-making authority over the methods to be used. Harassment techniques that involve noise-making could conceivably disturb users of historic properties if they were used at or in close proximity to such properties; however, it would be an exceedingly rare event for noise-producing devices to be used in close proximity to such a property unless the resource being protected from bird damage was the property itself, in which case the primary effect would be beneficial. Also, the use of such devices is generally short-term and could be discontinued if any conflicts with historic properties arose. WS has determined BDM actions are not undertakings as defined by the NHPA because such actions do not have the potential to result in changes in the character or use of historic properties.

1.7.2.6 The Clean Water Act (33 U.S.C. 1344)

The Clean Water Act provides regulatory authority and guidelines for the EPA and the U.S. Army Corps Of Engineers related to wetlands. Several Sections of the Clean Water Act pertain to regulating effects to wetlands. Section 101 specifies the objectives of this Act, which are implemented largely through Subchapter III (Standards and Enforcement), Section 301 (Prohibitions). The discharge of dredged or fill material into waters of the United States is subject to permitting specified under Subchapter IV (Permits and Licenses) of this Act. Section 401 (Certification) specifies additional requirements for permit review particularly at the State level. WS consults with appropriate regulatory authorities when wetlands exist in proximity to proposed activities or when such activities might impact wetland areas. Such consultations are designed to determine if any wetlands will be affected by proposed actions.

1.7.2.7 Executive Order 13112 On Invasive Species

Executive Order 13112 - Invasive Species directs Federal agencies to use their programs and authorities to prevent the spread or to control populations of invasive species that cause economic or environmental harm, or harm to human health. In Kentucky, WS responds to a number of requests for assistance with human health and safety threats associated with large populations of feral domestic pigeons, European starlings, and English sparrows, all invasive non-native species in the United States. To comply with Executive Order 13112, WS may cooperate with other Federal, State, or Local government agencies, or with industry or private individuals to reduce damage to the environment or threats to human health and safety.

1.7.2.8 Memoranda Of Understanding (MOU) Between Various Agencies And WS In Kentucky

A MOU (Appendix C) among the Kentucky Cooperative Extension Service, Kentucky Department Of Agriculture, Cabinet For Human Resources, Department of Health Services, Kentucky Department of Fish and Wildlife Resources (KDFWR), Natural Resources and Environmental Protection Cabinet, Department For Natural Resources, Department For Environmental Protection, and WS was developed in 1988. Its objectives were to 1) establish a collaborative relationship among the named participants for planning, coordinating, and implementing of animal damage control policies developed to prevent or minimize damage caused by wild animal species, including threatened and endangered species, to agriculture, horticulture, animal husbandry, forestry, wildlife, and human health, safety or other property, and 2) facilitate exchange of information. This MOU allows Kentucky agencies concerned with protection of resources and public health to collaborate with WS in programs in Kentucky to achieve mutual objectives. WS consults with these various agencies from time to time in the process of assisting Kentuckians in resolving wildlife damage conflicts, and these agencies refer appropriate wildlife damage complaints to WS.

1.7.2.9 Kentucky Nuisance Wildlife Control Permit

WS annually applies for a Kentucky Nuisance Wildlife Control permit for the purpose of addressing wildlife damage problems involving species regulated or protected by Kentucky law. In this procedure, an annual report of activities related to these species is provided to KDFWR which approves all nuisance wildlife control permits in Kentucky. WS complies with all requirements of the permit and exchanges information with KDFWR about wildlife damage and its management as part of this cooperative relationship.

2.0 CHAPTER 2 - ISSUES

Chapter 2 contains a discussion of the issues, including issues that will receive detailed environmental effects analysis in Chapter 4 (Environmental Consequences), issues that have driven the development of mitigation measures and/or standard operating procedures, and issues that will not be considered in detail, with rationale. Pertinent portions of the affected environment will be included in this chapter in the discussion of issues used to develop mitigation measures. Additional description of affected environments will be incorporated into the discussion of the environmental effects in Chapter 4.

2.1 SUMMARY OF ISSUES

The following issues have been identified as areas of concern requiring consideration in this EA. These will be analyzed in detail in Chapter 4:

- Effects on Wildlife Including Target and Nontarget Species and T&E Species
- Effects on Human Health and Safety
- Effects on Socio-economics of The Human Environment
- Effects on Wetlands

2.2 ISSUES ADDRESSED IN THE ANALYSIS OF ALTERNATIVES

2.2.1. Effects on Wildlife

2.2.1.1 Effects on Target Bird Species Populations

A common concern among members of the public is whether wildlife damage management actions adversely affect the viability of target species populations. The target species selected for analysis in this EA are the primary ones which may be affected by WS's BDM activities in Kentucky which are species of which more than just a few individuals would likely be killed by WS's use of lethal control methods under the proposed action in any single year. Those species include European starlings, feral domestic pigeons, and English sparrows. These three species are all nonnative exotics. Other species that have been killed in relatively low numbers include blackbirds (including common grackles, red-winged blackbirds and brown-headed cowbirds; an annual average of 876 was killed during FY 1997-99), killdeer (an average of 173 was taken annually by WS in Kentucky during the 3-year period of FY 1997-1999), mourning doves (an annual average of 580 was taken during the period), and red-tailed hawks (an average of 28 per year was taken during the period). Almost all of these birds were removed from airport environs during activities to protect air passenger safety.

2.2.1.2 Effects on Nontarget Species populations, including T&E Species

A common concern among members of the public and wildlife professionals, including WS personnel, is the impact of damage control methods and activities on nontarget species, particularly T&E Species. WS's standard operating procedures include measures intended to mitigate or reduce the effects on nontarget species populations and are presented in Chapter 4.

Special efforts are made to avoid jeopardizing Threatened and Endangered Species through biological evaluations of the potential effects and the establishment of special restrictions or mitigation measures. WS has consulted with the USFWS under Section 7 of the Endangered Species Act (ESA) concerning potential effects of BDM methods on T&E species and has obtained a Biological Opinion

(B.O.). For the full context of the B.O., see Appendix F of the ADC FEIS (USDA 1994, Appendix F). WS is also in the process of reinitiating Section 7 consultation at the program level to assure that potential effects on T&E species have been adequately addressed.

Some nontarget species may actually benefit from BDM. Prime examples are the benefit to native cavity nesting bird species that results from any reduction in starling populations or the benefit to a number of bird species, including some T&E species, that results from reductions in populations of brown-headed cowbirds which parasitize nests of other birds.

2.2.2 Effects on Human Health and Safety

2.2.2.1 Safety and Efficacy of Chemical Control Methods.

The public is sometimes concerned about chemicals used in bird control programs because of potential adverse effects on people from being exposed either to the chemicals directly or to birds that have died as a result of the chemical use. Under the alternatives proposed in this EA, the primary toxicant proposed for use by WS is DRC-1339 (Starlicide), which would be primarily used to remove feral domestic pigeons and European starlings or blackbirds in damage situations. DRC-1339 use is regulated by the EPA through FIFRA, by Kentucky State Pesticide Control Laws, and by WS Directives. Another chemical method that could be used is Avitrol which is classified as an avian distressing agent and is normally used to deter target bird species from using certain problem areas. Other chemicals available for use include the tranquilizer Alpha-chloralose (for live-capturing nuisance waterfowl and pigeons) anthraquinone (Flight Control), and methyl and di-methyl anthranilate (artificial grape flavoring, which also has bird repellent capabilities).

2.2.2.2 Effects on Human Health And Safety From Non-chemical BDM Methods

Some people may be concerned that WS's use of firearms and pyrotechnic bird scaring devices could cause injuries to people. WS personnel occasionally use small caliber firearms, air guns (air rifles and air pistols), and shotguns to remove or scare birds such as roosting European starlings and blackbirds, and feral domestic pigeons that are causing damage. Shotguns may also be used on airports to scare or remove birds which pose a threat to aircraft or air passenger safety. WS frequently uses pyrotechnics in noise harassment programs to disperse or move birds. There is some potential fire hazard to private property from pyrotechnic use. In Kentucky, during FY 1997-99, WS conducted 375 damage management events using firearms or air guns which involved the discharge of 6,314 projectiles without any injuries occurring. Similarly, 454 pyrotechnic events were conducted aimed at harassment of various animals and involved the discharge of 15,263 pyrotechnics during the same period without any accidents.

2.2.2.3 Effects on Human Health And Safety From Not Conducting BDM to Reduce Human / Aggressive Bird Confrontations, Disease Threats or Outbreaks And Bird Strike Hazards at Airports

The concern stated here is that the absence of adequate BDM would result in adverse effects on human health and safety, because attacks on humans by some birds, especially nesting Canada geese, the transmission of bird-borne diseases, and bird strikes on aircraft would not be reduced to acceptable levels. In Kentucky, WS conducts at least five projects annually to address human health and safety concerns at business facilities, private property, or for Local governments. At some sites, nesting Canada geese have been observed to attack employees or patrons. Such attacks can lead to human

injury, expensive medical bills, and lawsuits. At other sites, property managers are concerned about sanitation where birds have deposited droppings and litter.

Sites where roosting birds, such as European starlings and blackbirds, have deposited considerable quantities of droppings are viewed as unacceptably filthy. In addition, such locations are likely to harbor infective levels of *Histoplasma capsulatum*, posing a threat of disease to humans (Stickley and Weeks 1985) or *Cryptococcus neoformans* (U.S. Environmental Hygiene Agency 1992), as discussed in Subsection 1.3.2. Many cases of subclinical histoplasmosis are associated with sites known to have infective levels of the organism (Kentucky Epidemiological Notes & Reports, 1992). Part of programs to sanitize such sites includes reducing the use of the area by birds.

Property managers fear that the absence of the WS BDM could mean that birds would continue to use these areas and humans would still be at risk for bird-caused injuries or diseases.

As discussed in Subsection 1.3.3, WS frequently assists airports in Kentucky who seek to resolve wildlife hazards to air passengers. Airport managers and air safety officials are concerned that the absence of a WS BDM could lead to failure to be able to adequately address the complex wildlife hazard problems faced by these facilities. Hence, potential effects of not conducting such work could lead to an increased incidence of injuries or loss of human lives from bird strikes to aircraft.

2.2.3 Effects On Socio-cultural And Economics of The Human Environment

2.2.3.1 Effects on Human Affectionate-Bonds With Individual Birds And on Aesthetic Values of Wild Bird Species

Some individual members or groups of wild and feral domestic bird species habituate and learn to live in close proximity to humans. Some people in these situations feed such birds and/or otherwise develop emotional attitudes toward such animals that result in aesthetic enjoyment. In addition, some people consider individual wild birds as "pets," or exhibit affection toward these animals. Examples would be people who visit a city park to feed waterfowl or pigeons and homeowners who have bird feeders or bird houses. Many people do not develop emotional bonds with individual wild animals, but experience aesthetic enjoyment from observing them.

Public reaction to damage management actions is variable because individual members of the public can have widely different attitudes toward wildlife. Some individuals that are negatively affected by wildlife support removal or relocation of damaging wildlife. Other individuals affected by the same wildlife may oppose removal or relocation. Individuals unaffected by wildlife damage may be supportive, neutral, or opposed to wildlife removal depending on their individual personal views and attitudes.

The public's ability to view wild birds in a particular area would be more limited if the birds are removed or relocated. However, immigration of birds from other areas could possibly replace the animals removed or relocated during a damage management action. The opportunity to view or feed other wildlife would also be available if an individual makes the effort to visit other parks or areas with adequate habitat and local populations of the species of interest. In addition, WS BDM actions rarely remove all birds or even all birds of one species from a locale where actions occur. Sometimes the live capture and translocation of Canada geese or mallard ducks result in the complete removal of all of these birds from one pond, but adjacent ponds in nearby neighborhoods still contain other geese and ducks. In most instances in Kentucky where WS conducts such activities, other geese and

ducks are observed to fly into the project area before WS employees depart with captured birds. There are also occasions when WS intentionally leaves a few birds, although they could be captured. This usually occurs when such a request has been made by an interested citizen and when those requesting service do not object.

Some people do not believe that geese, or nuisance blackbird or starling roosts should even be harassed to stop or reduce damage problems. Some of them are concerned that their ability to view birds is lessened by WS nonlethal harassment efforts.

Some individuals are offended by the presence of English sparrows, blackbirds, and European starlings. To such people these species represent pests which are nuisances and intruders into the natural order in the United States and sowers of diseases transmissible to humans. Their overall enjoyment of other birds is diminished by what they view as a destructive presence of such species. They are offended that such birds proliferate in such numbers and appear to remain unchecked.

2.2.3.2 Effects on Aesthetics and Value of Property Damaged by Birds

Property owners that have pigeons roosting or nesting on their buildings or waterfowl grazing on turf areas are generally concerned about the negative aesthetic appearance of bird droppings and the damage to turf. Business owners generally are particularly concerned because negative aesthetics can result in lost business. Costs associated with property damage include labor and disinfectants to clean and sanitize fecal droppings, implementation of nonlethal wildlife management methods, loss of property use, loss of aesthetic value of flowers, gardens, and lawns consumed by geese, loss of customers or visitors irritated by the odor of, or of having to walk on, fecal droppings, repair of golf greens, replacing grazed turf, and loss of time contacting local health departments and wildlife management agencies on health and safety issues.

2.2.4 Humaneness and Animal Welfare Concerns of Methods Used by WS

The issue of humaneness and animal welfare, as it relates to the killing or capturing of wildlife is an important but very complex concept that can be interpreted in a variety of ways. Schmidt (1989) indicated that vertebrate pest damage management for societal benefits could be compatible with animal welfare concerns, if "*... the reduction of pain, suffering, and unnecessary death is incorporated in the decision making process.*"

Suffering is described as a "*... highly unpleasant emotional response usually associated with pain and distress.*" However, suffering "*... can occur without pain ...*," and "*... pain can occur without suffering ...*" (AVMA 1987). Because suffering carries with it the implication of a time frame, a case could be made for "*... little or no suffering where death comes immediately ...*" (CDFG 1991), such as shooting.

Defining pain as a component in humaneness of WS methods appears to be a greater challenge than that of suffering. Pain obviously occurs in animals. Altered physiology and behavior can be indicators of pain, and identifying the causes that elicit pain responses in humans would "*... probably be causes for pain in other animals ...*" (AVMA 1987). However, pain experienced by individual animals probably ranges from little or no pain to considerable pain (CDFG 1991).

Pain and suffering, as it relates to WS damage management methods, has both a professional and lay point of arbitration. Wildlife managers and the public would be better served to recognize the

complexity of defining suffering, since "... *neither medical or veterinary curricula explicitly address suffering or its relief*" (CDFG 1991).

Therefore, humaneness, in part, appears to be a person's perception of harm or pain inflicted on an animal, and people may perceive the humaneness of an action differently. The challenge in coping with this issue is how to achieve the least amount of animal suffering within the constraints imposed by current technology and funding.

WS has improved the selectivity and humaneness of management techniques through research and development. Research is continuing to bring new findings and products into practical use. Until new findings and products are found practical, a certain amount of animal suffering could occur when some BDM methods are used in situations where nonlethal damage management methods are not practical or effective.

Kentucky WS personnel are experienced and professional in their use of management methods so that they are as humane as possible under the constraints of current technology, workforce and funding. Mitigation measures/SOPs used to maximize humaneness are listed in Chapter 4.

2.3 ISSUES CONSIDERED BUT NOT IN DETAIL WITH RATIONALE

2.3.1. Appropriateness of Preparing an EA (Instead of an EIS) For Such a Large Area

Some individuals might question whether preparing an EA for an area as large as Kentucky would meet the NEPA requirements for site specificity. Wildlife damage management falls within the category of Federal or other agency actions in which the exact timing or location of individual activities cannot usually be predicted well enough ahead of time to accurately describe such locations or times in an EA or EIS. The WS program is analogous to other agencies or entities with damage management missions such as fire and police departments, emergency clean-up organizations, insurance companies, etc. Although WS can predict some of the possible locations or *types* of situations and sites where some kinds of wildlife damage will occur, the program cannot predict the specific locations or times at which affected resource owners will determine a bird damage problem has become intolerable to the point that they request assistance from WS. Nor would WS be able to prevent such damage in all areas where it might occur without resorting to destruction of wild animal populations over broad areas at a much more intensive level than would be desired by most people, including WS and State agencies. Such broad scale population control would also be impractical, or impossible, to achieve.

If a determination is made through this EA that the proposed action would have a significant environmental impact, then an EIS would be prepared. In terms of considering cumulative effects, one EA analyzing impacts for the entire State may provide a better analysis than multiple EA's covering smaller zones.

2.3.2 Effects of Hazing Programs on Livestock

Some individuals have raised concerns that noise from pyrotechnics used to harass birds could startle livestock and cause them to run through fences and be injured. One horse breeder has voiced concern that startling effects could adversely affect breeding success. WS employees experienced in using pyrotechnics have noted that most animals habituate relatively easily to noises from the pyrotechnics. However, personnel avoid shooting pyrotechnics near identified livestock facilities where operators

have expressed concerns. On the other hand, Kentucky WS personnel have conducted feral domestic pigeon population reduction activities, using shotguns, at a horse holding and training facility in which the owner requested that the horses be left in a nearby corral in order that they might become habituated to sudden loud noises (R. Myers, WS Pers. Comm. 1999). During these events which occurred during three successive years, horses ran moderately for the first 20 minutes and afterward were passive toward the explosive sounds of gun shots. Hundreds of shots were also discharged over more than 50 dairy cattle within 50 yards of activities at the same site with almost no response from the cattle.

2.3.3 Effects On Public Use of Migratory Birds

Many migratory bird species offer enjoyment to bird watchers and hunters and provide a significant economic contribution in Kentucky. During 1996, more than 700,000 people participated in activities such as wildlife watching and hunting of migratory birds in the State. In pursuit of recreation related to photographing, feeding, watching, and hunting migratory birds, they contributed more than \$219 million to the economy of the State for expenses related to travel, equipment, feed, licenses, wildlife club membership and other associated costs (USDI-FWS-USDC 1996). Because migratory birds are such a significant economic and recreational resource, there may be concerns that WS BDM actions related to managing damage by migratory birds, especially waterfowl, might negatively affect these factors.

Almost all BDM activities during FY 1997-99 which involved waterfowl occurred in cities and towns where hunting is forbidden by municipal statute. Waterfowl were live-captured through various approved methods and translocated to wild sites mutually agreed upon between KDFWR and WS. The primary objective in these translocation projects is to distribute waterfowl in such a manner as to both benefit the geese and ducks, and provide recreational opportunity to the public.

Exceptions to live capture and translocation of waterfowl in the Kentucky BDM program occur in relation to waterfowl on airports. Sometimes such birds are killed when air passenger safety is threatened. Only a few waterfowl are killed each year on airports in Kentucky by WS. During FY 1997-99 WS killed an annual average of 26 Canada geese in all airport BDM programs in State.

Mourning doves are also addressed in BDM programs throughout the State. However, WS kills very few of these birds except in airport programs in protection of human safety related to air travel. WS killed an average of 510 mourning doves each year during FY 1997-99 in airport BDM activities in Kentucky. Most of these birds are killed in harassment/shooting activities. In at least one instance, these harassment/shooting activities move birds to locations adjacent to the airport where dove hunting is allowed. Hunting by the public at airports in Kentucky where WS conducts BDM is forbidden and bird watching is extremely limited because visitors to airport properties for such purposes are forbidden. Mourning dove populations are very healthy in the U. S. and no difficulty related to scarcity of the species is encountered in watching or hunting them. Population information and environmental consequences of WS BDM actions related to mourning doves in Kentucky are discussed in Subsection 5.1.1.1.

2.3.4 WS's Effect on Biodiversity

The WS program does not attempt to eradicate any species of wildlife in Kentucky. WS operates in accordance with international, Federal and State laws, and regulations enacted to ensure species viability. Effects on target and nontarget species populations because of WS's lethal BDM activities

are minor as shown in Section 5.1. The effects of the current WS program on biodiversity are not significant nationwide or statewide (USDA 1994). In the case of local populations of nonnative species such as feral domestic pigeons, the goal may be to eliminate a local population but because such species are not part of the mix of native wildlife species, they are not an essential component of the native biodiversity. Rarely, if ever, would BDM result in the long term local elimination of even these nonnative species, however.

2.3.5 Wildlife Damage is a Cost of Doing Business -- a "Threshold of Loss" Should Be Established Before Allowing Any Lethal Bird Damage Management.

WS is aware that some people feel Federal wildlife damage management should not be allowed until economic losses reach some arbitrary predetermined threshold level. Such policy, however, would be difficult or inappropriate to apply to human health and safety situations. Although some damage can be tolerated by most resource owners, WS has the legal direction to respond to requests for assistance, and it is program policy to aid each requester to minimize losses. WS uses the Decision Model thought process discussed in Chapter 4 to determine appropriate strategies.

In a ruling for Southern Utah Wilderness Alliance, et al. vs. Hugh Thompson, Forest Supervisor for the Dixie National Forest, et al., the United States District Court of Utah denied plaintiffs' motion for preliminary injunction. In part the court found that a forest supervisor needs only show that damage from wildlife is threatened, to establish a need for wildlife damage management (Civil No. 92-C-0052A January 20, 1993). Thus, there is judicial precedence indicating that it is not necessary to establish a criterion such as percentage of loss of a particular resource to justify the need for wildlife damage management actions.

2.3.6 Wildlife Damage Management Should Not Occur at Taxpayer Expense, But Should Be Fee-Based

WS is aware of concerns that wildlife damage management should not be provided at the expense of the taxpayer, or that it should be fee-based. WS was established by Congress as the agency responsible for providing wildlife damage management to the people of the United States. Funding for WS comes from a variety of sources in addition to Federal appropriations. Such non-Federal sources include State general appropriations, Local government funds (county or city), livestock associations, Indian tribes, and private funds which are all applied toward program operations. Federal, State, and Local officials have decided that some BDM by WS should be conducted by appropriating funds. Additionally, wildlife damage management is appropriate for government programs, since wildlife management is a government responsibility. A commonly voiced argument for publicly funded wildlife damage management is that the public should bear responsibility for damage to private property caused by public wildlife.

A minimal Federal appropriation is allotted for the maintenance of a WS district office in Kentucky. The remainder of the WS program is entirely fee-based. Technical assistance is provided to requesters as part of the Federally-funded activities, but all direct assistance in which WS employees perform damage management activities is funded through cooperative agreements between the requester and WS. Thus, BDM by WS in Kentucky is fee-based to a high degree.

2.3.7 Cultural Resource Concerns

The National Historic Preservation Act (NHPA) of 1966, and its implementing regulations (36 CFR

800), requires Federal agencies to: 1) determine whether activities they propose constitute "undertakings" that can result in changes in the character or use of historic properties and, 2) if so, to evaluate the effects of such undertakings on such historic resources and consult with the State Historic Preservation Office regarding the value and management of specific cultural, archaeological and historic resources. WS BDM actions do not cause ground disturbances nor do they otherwise normally have the potential to affect visual, audible, or atmospheric elements of historic properties and are thus not undertakings as defined by the NHPA. Harassment techniques that involve noise-making could conceivably disturb users of historic properties if they were used at or in close proximity to such properties; however, it would be an exceedingly rare event for noise-producing devices to be used in close proximity to such a property unless the resource being protected from bird damage was the property itself, in which case the primary effect would be beneficial. Also, the use of such devices is generally short-term and could be discontinued if any conflicts arose with the use of historic properties.

2.3.8 Environmental Justice And Executive Order 12898 - *"Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations."*

Environmental Justice (EJ) is a movement promoting the fair treatment of people of all races, income levels and cultures with respect to the development, implementation and enforcement of environmental laws, regulations and policies. EJ, also known as Environmental Equity, has been defined as the pursuit of equal justice and equal protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, or socioeconomic status.

EJ is a priority both within APHIS and WS. Executive Order 12898 requires Federal agencies to make EJ part of their mission, and to identify and address disproportionately high and adverse human health and environmental effects of Federal programs, policies and activities on minority and low-income persons or populations. APHIS plans to implement Executive Order 12898 principally through its compliance with the provisions of NEPA.

All WS activities are evaluated for their impact on the human environment and compliance with Executive Order 12898 to insure EJ. WS personnel use wildlife damage management methods as selectively and environmentally conscientiously as possible. It is not anticipated that the proposed action would result in any adverse or disproportionate environmental effects to minority and low-income persons or populations.

2.3.9 Lethal BDM For Blackbirds And European Starlings Is Futile Because 50-65% of Them Die Each Year Anyway

Because natural mortality in blackbirds populations is 50 - 65% per year (see Subsection 5.1.1.1), some persons argue that this shows lethal BDM actions are futile. However, the rate of natural mortality has little or no relationship to the effectiveness of lethal BDM because natural mortality generally occurs randomly throughout a population and throughout the course of a year. Natural mortality is too gradual in individual concentrations of depredating birds to adequately reduce the damage that such concentrations are causing. It is probable that mortality caused by BDM actions is not additive to natural mortality but merely displaces it as "compensatory" mortality (Bailey 1984). In any event, it is apparent that the rate of mortality from BDM is well below the extent of any natural fluctuations in overall annual mortality and is, therefore, insignificant to national or eastern U.S. populations. Population estimates and trends for European starlings and blackbirds in the U.S. and for the eastern U.S. are discussed in Subsection 5.1.1. The objective of lethal BDM in Kentucky is

not to necessarily add to overall blackbird or starling mortality, which would be futile under current funding limitations, but to redirect mortality to a segment of the population that is causing damage in order to realize benefits during the current production season. The resiliency of these bird populations does not mean individual BDM actions are not successful in reducing damage, but that periodic and recurring BDM actions are necessary in many situations.

2.3.10 Cost Effectiveness of BDM

Perhaps a better way to state this issue is by the question "Does the value of damage avoided equal or exceed the cost of providing BDM?" The Council on Environmental Quality (CEQ) regulations (40 CFR 1502.23) do not require a formal, monetized cost-benefit analysis to comply with NEPA. Consideration of this issue is not essential to making a reasoned choice among the alternatives being considered. The ADC EIS, Appendix L, p. 32 (USDA 1994) stated:

Cost effectiveness is not, nor should it be, the primary goal of the APHIS WS program. Additional constraints, such as environmental protection, land management goals, and others, are considered whenever a request for assistance is received. These constraints increase the cost of the program while not necessarily increasing its effectiveness, yet they are a vital part of the APHIS WS program.

An analysis of cost-effectiveness in many BDM situations is exceedingly difficult or impossible to perform because the value of benefits is not readily determined. For example, the potential benefit of eliminating feral domestic pigeons from roosting and nesting around heating and cooling structures on a school or hospital could be reduced incidences of illness among unknown numbers of building users. Since some of the bird-borne diseases described in Chapter 1 are potentially fatal or severely debilitating, the value of the benefit may be high. However, no studies of disease problems with and without BDM have been conducted, and, therefore, the number of cases *prevented* by effective BDM is not possible to estimate. Also, it is rarely possible to conclusively prove that birds are responsible for individual disease cases or outbreaks.

The WS program in Arizona prepared an analysis of cost vs. avoided loss for feedlot and dairy operations that received BDM service. The analysis indicated that the value of feed saved from blackbird and starling damage by BDM with DRC-1339 exceeds the cost of the service by a factor of three-to-one, without considering other benefits such as prevention of disease transmission, restored weight gain performance, and milk yields (USDA 1996). A similar analysis in Idaho yielded a ratio of avoided losses to cost of about four-to-one (USDA 1998a). Although not available for Kentucky feedlots and dairies, because this type of BDM has been extremely limited, the Arizona and Idaho analyses indicate blackbird and starling control at dairies and feedlots is cost-effective.

2.3.11 Protection of Children from Environmental Health and Safety Risks (Executive Order 13045)

Children may suffer disproportionately from environmental health and safety risks for many reasons. BDM as proposed in this EA would only involve legally available and approved damage management methods in situations or under circumstances where it is highly unlikely that children would be adversely affected. Therefore, implementation of the proposed action would not increase environmental health or safety risks to children.

3.0 CHAPTER 3: OBJECTIVES

Chapter Three examines objectives of the BDM program in Kentucky. The Government Performance and Results Act of 1993 requires that Federal agencies develop program strategies and set goals which are measurable. Further, entities which cooperate with WS in BDM projects have developed objectives related to resolving wildlife damage. These goals may be driven by policy, governmental regulation, welfare of employees and the public, corporate image, customer satisfaction, or a combination of any of these. WS pursues goals related to wildlife damage management as set forth in the WS programmatic Strategic Plan (USDA - APHIS - ADC, 1989). Such goals may be reflected in local and state level wildlife damage management programs conducted by WS throughout the United States. Goals discussed in this EA reflect the most reasonable outcome of an effective BDM program in which Cooperators and WS participate.

3.1 SUMMARY OF OBJECTIVES

Wildlife Services will measure achievement of objectives for BDM Direct Assistance programs in Kentucky by attaining and/or maintaining an "adequate grade," as defined in section 3.3 and 3.4 for a set of defined objectives presented below:

- Reductions In Bird-caused Human Health And Safety Incidents And/Or Maintenance Of Previously Attained Reductions Calculated As Damage Losses Averted Or Resources Saved
- Reductions In Damage To Agriculture Caused By Birds And/Or Maintenance Of Previously Attained Reductions Calculated As Damage Losses Averted Or Resources Saved
- Reductions In Damage To Property Caused By Birds And/Or Maintenance Of Previously Attained Reductions Calculated As Damage Losses Averted Or Resources Saved
- Reductions In Damage To Natural Resources Caused By Birds And/Or Maintenance Of Previously Attained Reductions Calculated As Damage Losses Averted Or Resources Saved

3.2 DESCRIPTION OF OBJECTIVES

In this section objectives of the proposed action are discussed and ways that achievement of these objectives will be measured are presented. Measurement of success in wildlife damage management projects is sometimes difficult and may sometimes be subjective. The purpose of this discussion is to inform the public regarding views about damage caused by birds, and expectations, or objectives of both WS and those who participate with WS in programs to reduce that damage.

3.2.1 Reductions In Damage To Agriculture

Agriculture is Kentucky's largest industry representing over \$3.9 billion in sales from the farm gate in 1998 (L. E. Brown, 1999). Products include a wide selection of field crops including tobacco, corn, wheat, sorghum, soybeans, and hay. Also included are livestock such as dairy cattle, beef cattle, pigs, chickens, fish, and livestock products such as milk and eggs. WS has received requests for assistance related to damage by birds to several of these resources in the past. Some examples are blackbird and Canada goose damage to wheat, Canada goose damage to corn, soybeans, hay, and tobacco, vulture predation on piglets and calves, disease threats to poultry operations from Canada geese, and disease threats to cattle from foraging and loafing European starlings (USDA-WS MIS Database). Complainants sometimes feel that their livelihoods are threatened and have usually tried

unsuccessfully to resolve such damage through various self-help techniques. Reducing damage to resources is often considered by farmers as necessary to insure an adequate income or to avoid serious problems with farm operations. The aim of WS BDM programs will be to provide solutions to bird damage situations which will allow agricultural producers to obtain a net gain in production as a result of a reduction in bird damage. Prudent measures for reducing or eliminating bird-caused damage will be recommended to requesters or implemented by WS in direct assistance programs. Such activities may include any of the approved methods summarized in Subsection 4.2.4., and may be directed toward resolving damage caused by any bird species including, but not limited to, those listed in Subsection 1.2.

3.2.2 Reductions In Bird-caused Human Health And Safety Incidents

A number of complainants who seek assistance from WS regarding real or potential threats to human health and safety are usually concerned with unsanitary conditions created by excessive deposits of bird droppings. Although most people are not very familiar with diseases associated with bird roosts where droppings abound they feel uncomfortable or threatened by the filth and perceived threats. Some individuals seem informed about potential diseases and discuss them readily. More than 80% of calls for assistance with bird problems in urban areas of Kentucky are the result of concerns for threats to human health and safety (K. Garner, WS 1999). Some complaints related to human health and safety are also made because birds are creating fire hazards by building nests around electrical wires and lighting, or because birds such as adult Canada geese are being aggressive toward humans (USDA-WS MIS Database).

Birds pose considerable threats to air passenger safety at airports (USDOT 1997). Although very few flights result in plane crashes and the death of those aboard, some people are apprehensive about flying because of the threat of a bird/aircraft strike. For them resolution of threats to aircraft traffic posed by birds at airports is very important. WS receives several requests each year from airport managers for assistance in resolving damage threats posed by birds as part of their program to insure safety at airports.

Resolving bird damage of this nature is the primary goal of both those experiencing damage and WS. Programs are tailored to achieve this end, and cooperators and WS actively participate in various increments of a project. Such activities may include any of the approved methods summarized in Subsection 4.2.4, and may be directed toward resolving damage caused by any bird species including, but not limited to, those listed in Subsection 1.2.

3.2.3 Reductions In Damage To Property Caused By Birds

During FY 1997 - 99 average annual losses to bird damage in Kentucky were \$695,000 (USDA-WS MIS Database). Birds were the major damaging agents among wildlife groups during this period accounting for 64% of all property damage losses recorded by WS. Types of property damaged included residential and non-residential buildings, lawn furniture, sidewalks, landscape ornamentals and shrubs, vegetable gardens and fruit on backyard trees, pets, aircraft, beaches, equipment and machinery, electrical utilities, bridges, and recreational beaches, to name a few (USDA-WS MIS Database). Sometimes damages could be rectified through cleaning damaged property, or repairing it, as in cases where excessive bird droppings fouled clothing, lawn furniture, sidewalks or structures, caused the degradation of painted surfaces, or where bird strikes to aircraft damaged components of the airplane. Such repair or cleanup costs are sometimes factored in as part of the damage values.

Damage resulting from bird consumption of garden products or fruits was irreconcilable and costs

of replanting or purchasing what was grown at a commercial source may have been factored into the loss value. These loss values represent real investments by persons who experienced damage. That segment of the public which contacts WS regarding damage to property usually have specific objectives in mind. These objectives always include eliminating damage, or reducing it to acceptable levels. WS works with individuals and entities to design professional and responsible programs based on sound wildlife management to address such damage. Methods developed for implementation to reduce or eliminate damage to property may include any of the approved methods summarized in Subsection 4.2.4 and may be directed toward resolving damage caused by any bird species including, but not limited to, those listed in Subsection 1.2.

3.2.4. Reductions In Damage To Natural Resources Caused By Birds

Natural resource damage by birds in Kentucky consists of, but is not limited to, incidents such as predation on game fish or fry at sites such as State fish hatcheries, or predation on endangered species such as owl predation on peregrine falcons as discussed in Subsection 1.3.9. Other instances are red-tailed hawk predation on songbirds at backyard bird feeders, and woodpecker damage to trees in natural areas. Natural resource managers and the public are often concerned with total elimination of such damage because natural resources are often viewed as rare, and some are unrenewable. WS cooperates with individuals seeking resolution of damage to natural resources in programs which are often designed on a case by case basis because of the frequently unique nature and setting of such damage. Consideration for preserving other valuable resources is often requisite to such damage management activities. For instance, WS participated with USFWS and Californian Fish and Game to conduct a program to protect California least terns (*Sterna antillarum brownii*), an endangered species, from predation by peregrine falcons, another endangered species (B. Dunlap WS, Pers. Comm. 2000). A complex program was necessary in order to accommodate both species while seeking the preservation of one. Such programs have specific guidelines and objectives with measurable results. WS may develop other programs in Kentucky to address bird damage to natural resources in the future. Such activities may include any of the approved methods summarized in Subsection 4.2.4, and may address damage by any bird species including, but not limited to, those listed in Subsection 1.2.

3.3 METHODS FOR MEASURING ACCOMPLISHMENTS OF OBJECTIVES IN DIRECT ASSISTANCE PROGRAMS

All BDM program objectives discussed have reductions in damage as a common denominator. However, quantifying levels of reductions in damage, or documenting degrees of reduction in damage is sometimes difficult. Participants with WS in BDM programs often are not familiar with attaching dollar loss values to previously existing damage, and records of costs related to attempts to deal with bird damage are poorly kept. For that reason, historical loss values are sometimes missing and WS derives only current loss values when a site is inspected during damage evaluation activities. This situation is further complicated by the fact that no scientifically based method for standardizing calculations of losses related to human health and safety threats exist. Valuable information about dollar costs to the public regarding human health and safety threats, or actual damage or death to humans, may not be reported because of the absence of established loss values. However, some factors related to expectations of cooperators regarding damage abatement may be used to provide acceptable indicators of accomplishment in BDM programs. In addition, factors measurable by WS can serve to supplement or further validate those indicators.

Losses in general are often thought of in terms of what is damaged or destroyed when birds become a problem. Such things as acres of crops or pounds of fish eaten, or damages to airplanes resulting from

bird strikes are concrete losses which are directly apparent. However, other losses just as meaningful are financial costs for equipment replacement, repair, medical costs for injuries or disease, cost of seeds for replanting of crops, cost of cleaning areas damaged by bird droppings, and many others. There are also often collateral costs which are an outgrowth of bird damage, or subsequent efforts to address it. These latter two types of indirect losses are often overlooked. Losses of this nature, such as lost time because of work stoppages, extra man hours required to address incidents which occur as a result of bird damage, loss in yields because of later replanting of crops, or reduction of egg production among hens because of a chronic disease transmitted by birds may account for an excessive quantity of total losses occurring as a result of bird damage. For the purposes of this EA, WS will define damage losses in the following ways:

A. Losses directly related to the presence of damaging birds such as, but not limited to:

- Birds consuming field crops or contaminating and rendering unusable a measurable quantity of stored grain or livestock feed
- The death of trees as a result of excessive droppings deposited in a roost site
- The consumption of fish by predaceous birds
- Birds of prey killing songbirds, pets or threatened or endangered species
- A bird strike to an airplane which damages the plane or injures or kills people
- Increased man hours or material for cleanup or repair of damage caused by birds
- Costs of BDM programs or techniques for reducing or eliminating the damage posed by birds

B. Losses indirectly related to the presence of damaging birds such as, but not limited to:

- Veterinary costs and husbandry costs for animals infected or infested by bird- borne diseases, or parasites
- Decreased production among livestock as a result of the presence of a disease introduced by birds
- Reduced yield in crops because of late replanting where birds have destroyed or caused damage to such crops
- Medical costs and lost days of work associated with contraction and treatment of bird- borne diseases among humans

3.3.1 Qualitative Methods

3.3.1.1 Cooperator Assessment Of Work Plan Accomplishments As A Measure Of Achieving Objectives

Communications between cooperators and WS during implemented programs are evolving processes in which information is shared about progress, problems and contingencies. Through the process both parties have opportunity to develop possible changes in program activities, address safety and protocol issues, and obtain further information about each other's roles. Cooperators also have opportunity to critique and grade a program's effectiveness. This input by cooperators will be used to determine efficacy of damage reductions by WS in BDM programs. WS personnel may gather this information during visits to the project site during discussions with cooperator management, or through voluntary written information provided by the cooperator. Present Federal restrictions prohibit WS from conducting customer satisfaction surveys. However, informal gathering of such information can be done and documented by the local WS Office.

In direct assistance BDM programs WS presents cooperators with some kind of work plan outlining what will be done during a project. Descriptions may include what damage will be addressed and by what means, and what species will be addressed as well as site specific procedures. These work plans are designed with consideration for cooperator needs, WS policy and procedure, best management practices for the specific project, and sound wildlife management practices. To obtain a measurement of objectives for a BDM program, WS will categorize opinions of Cooperators about effectiveness into the following numeric rating groups of 0 or 1:

A. Adequate (rating of 1): Cooperator opinions gathered by verbal or written communication and kept on file in WS records on that project will fit this category when the cooperator makes a statement that affirms that a program has been successful in resolving totally, or in an acceptable part, the damage related to the species being addressed. Normally this input will be sought from the primary contact person the cooperator has assigned.

Most BDM projects in the Kentucky WS program are dated and last for one year or less. Often cooperators request the renewal of such programs under new cooperative agreements at or near the expiration date of such agreements. WS will interpret the request by a cooperator for a renewal of the program as a grade of "adequate" and an indicator that the program has satisfactorily achieved damage reduction objectives, unless the cooperator states that renewal is sought so that damage reduction goals can be met. When this is the case, a record of the transaction will be filed in the local WS office. This may be a written record provided by the cooperator or a daily entry by the project specialist or supervisory biologist regarding a verbal statement by the cooperator.

Some BDM programs in Kentucky are requested because cooperators have sought a continuation of such projects in anticipation of a recurrence of damage factors which have historically been very costly. In some instances, such as the recurrence of human health and safety threats and damage to property by feral domestic pigeons and Europeans starlings and blackbirds, cessation of programs by WS has resulted in damage levels returning to pre-program proportions in less than three years. In such instances, cooperators are concerned with reducing damage to acceptable levels during initial programs, and maintaining those reductions in subsequent programs. This will be a factor used to determine accomplishment of objectives in BDM programs in Kentucky where cooperators have indicated, and WS has concluded, that initial objectives have been met but new programs have been requested. When other programs are negotiated by cooperators to retain damage reduction levels previously gained, statements by them about that maintenance will be indicators that the objectives were met. In subsequent programs, where maintaining the reduced damage levels previously achieved are an objective, statements by cooperators which indicate that an acceptable level of damage reduction has been maintained will be placed on record at the local WS office as evidence of achievement of objectives. These ratings will become part of the grading process outlined in this Section of which an example is presented in Table 3-1.

B. Inadequate (rating of 0): Statements by cooperators indicating that acceptable damage reduction levels were not achieved or maintained will be placed on record at the local WS office to indicate less than satisfactory achievement of objectives for that BDM program as measured by cooperator opinion. Such statements may be records of verbal communication with the cooperator by the BDM program specialist or the supervisory biologist or may be written

documentation by the cooperator. These ratings will become part of the grading process outlined in this Section of which an example is presented in Table 3-1.

3.3.2 Quantitative Methods

3.3.2.1 Observed / Calculated Damage Reductions As A Measure Of Achieving Objectives

Damage assessments by WS personnel are usually conducted when visiting a damage site and developing recommendations for solutions. Since these assessments usually occur before any work is done at a site, WS will use such evaluations to derive benchmark values for bird damage losses, which might occur without intervention of direct assistance programs. Such values may be used for site-specific reference or may be used to establish indices for similar bird damage projects.

Using damage loss values for site specific determination as to whether or not objectives have been met will be accomplished by comparing time-framed loss values before damage management activities began with time-framed loss values during or immediately following a BDM program. For instance, losses incurred by a cooperator during a one year interval prior to WS activities could be calculated, and one-year losses occurring during, or following, a WS implemented BDM program could be compared. If latter losses for a comparable time interval are less than former losses, the project will be given an adequate rating (rating of 1). If this is not the case and the latter losses are greater than, or equal to, the former losses an inadequate rating (rating of 0) will be given.

The following rules may be used by WS to obtain benchmark and comparison data:

- WS BDM program managers may use any reasonable time-frame for damage-loss value calculations, but pre- and post-time frames will be equal in the number of days being evaluated. Blocks of time used for calculations could be any time frame from a few days to one year. This would depend on the length of time cooperators have tracked losses, what elements of loss have been tracked, and length of a BDM program implemented, or length of time a BDM program continues through cooperative agreement renewals.
- WS BDM program managers may use any component of a specific project to calculate losses for analysis and conclusions. For instance, if WS conducts a county-wide program to protect agricultural crops from damage by Canada geese, the BDM program manager may use only seedling corn as the indicator crop if that is the primary protected crop and is the primary target of Canada geese for the county. Further, if only one farmer's corn crop is being damaged in that county, the WS BDM program manager may use that farmer's crops to measure damage and use the county average corn yield as a benchmark for comparison of losses.

3.3.2.2 Observed / Calculated Resources Saved As A Measure Of Achieving Objectives

As discussed earlier in this section, cooperators sometimes request and receive WS BDM services to protect resources because historical evidence related to their projects demonstrates that during periods of time in which no BDM activities are conducted, damage by birds increases to unacceptable proportions. In these continuing programs, previous time-framed damage-loss values may be outdated or unavailable. In these instances, WS often establishes the saving of

resources as objectives either in work plan outlines or in communications with cooperators. Saving resources which might otherwise be lost to damage by wildlife is an important priority to many resource managers who cooperate with WS. In addition, this aspect of agency mission objectives is considered by some to be pivotal to sound wildlife damage management (C. Brown, WS-ERO and M. Bodenchuk WS-UT, Pers. Comm. 1999). Resources saved might be viewed as that component of resources which are not destroyed, threatened, or reduced in value by the activity of damaging wildlife, or that portion of resources, such as manpower, equipment, material, or effort not expended to combat losses to wildlife. Projects that result in the saving of any resources that would have been lost without a BDM program will be given an adequate rating (rating of 1). Those projects that do not meet this criterion will be given an inadequate rating (rating of 0). Resources saved as a result of BDM programs in Kentucky may be used by some WS program managers as a component for determining whether objectives are achieved.

In order to appropriately determine resources saved in BDM programs, it is essential to identify the nature of damage to certain resources, and the way that such damage can occur. For instance, the presence of a flock of birds on the runway of an airport, during times when flights are arriving or departing, presents a threat to both aircraft and occupants therein (USDOT 1997) although no damage has yet occurred. Again, the presence of a chronic bird roost in a neighborhood can provide an environment beneath the roost for the development of the infectious fungal agent *Histoplasma capsulatum* and provide a histoplasmosis threat to the local residents. Although no case of histoplasmosis occurring among residents may be directly linked to the roost site, simply because the microscopic spores that cause the disease cannot be tracked, health professionals acknowledge that a threat of the disease exists for humans in the immediate area (Kentucky Epidemiological Notes & Reports, 1992). In both of these examples the resource is human health and safety and the damage is a safety or disease threat. It follows then, that if a BDM action or program disperses a flock of birds from a runway and thereby eliminates the threat to the safety of 250 air passengers, or disperses a flock of birds from a chronic residential roost where histoplasmosis may be a threat to 100 residents, both programs may be evaluated for resources saved. On the one hand, the airport action preserved 250 human lives from a potential safety threat and on the other, the residential action preserved 100 human lives from a potential health threat. WS addresses resource protection with consideration for such potential damage, and in calculating what resources are saved as a result of BDM programs this kind of damage will be factored into deriving conclusions about achieving objectives.

Determining the value and quantity of resources saved as a result of BDM programs becomes more straightforward when known losses can be calculated from historical data about a site where bird damage has occurred. However it is an extremely complicated issue, primarily because indices for resources lost during periods of no BDM activities are often incomplete or lacking and changes in the value or quantity of a managed resource are sometimes continuous. For example, the number of human lives protected by a BDM program at an airport that scares birds from the vicinity of runways changes from hour to hour and day by day. Again, a resource such as an agricultural crop changes in value by the season and amount of effort expended by the farmer to tend it. There are however, some instances in which known resources are expended or lost in the absence of BDM activities and these can be compared to the same or similar resource savings or losses during BDM programs to derive values for resources saved. An example might be a situation where a utility power company expended 200 additional man hours for two consecutive years to replace transformers destroyed by electrical shorts resulting from roosting birds on power lines, but when a BDM program was instituted, no bird-caused outages or destroyed transformers occurred during the year-long program. The following year another

BDM program was initiated and records of the utility company showed that again, no additional man-hours were expended resolving outages caused by birds for the second year. It follows that 400 man hours, or their dollar equivalent, represented resources saved by the utility company. Likewise, during a BDM project to reduce human health and safety threats arising from roosting European starlings at a factory, the WS program manager may select the number of employee-hours that workers had to work on surfaces fouled with bird droppings before initiation of a project and compare this to the same number of employee-hours that workers had to work on surfaces fouled with droppings within a duplicate time interval during, or following, a BDM program. The WS BDM program manager might also choose to count the number of employees who were exposed to accumulations of bird droppings before initiation of a BDM program and compare that number to those exposed at the same site during or after a BDM program. This would allow comparison of the number of potential disease exposures between the two time periods. In either scenario, a score of "adequate" or "inadequate" (1 or 0, respectively) would be obtained and could be used as part of the evaluation to determine whether or not objectives were met for the program.

3.4 DETERMINATION OF OVERALL OBJECTIVE GRADE

Success in meeting objectives for the Statewide BDM program will be determined using any combination which incorporates both qualitative and quantitative data, but the choice of components may depend on the availability and appropriateness of data. Thus a WS program manager may use Cooperator assessments, combined with observed / calculated damage reductions, or Cooperator assessments combined with observed / calculated resources saved to formulate a conclusion of record for the BDM program. Likewise, the WS program manager may use Cooperator assessments and a combination of observed / calculated damage reductions and observed / calculated resources saved to formulate a conclusion of record. This latter method is depicted in Table 3-1. A typical record would always contain Cooperator input grades, and could contain both damage reduction and resources saved grades, or only one of the two. Each separate record would have at least two grades.

Conclusions about accomplishments related to objectives in a statewide BDM program will be derived using both cooperator input (qualitative information) and WS calculated data (quantitative information), as available and appropriate, in the following way:

- A numeric rating will be obtained for each project by averaging together the qualitative and quantitative ratings that are derived from evaluating each specific program.
- A majority (51% or greater) grade of "Adequate" based on pooled grades from all BDM projects in Kentucky during the selected time frame will satisfy a conclusion that the program successfully met objectives set forth.
- WS BDM program managers will calculate and record a conclusion concerning program objectives on an annual basis for the overall statewide BDM program. This record will be derived by calculating a grade for each cooperative program upon its completion to derive individual values to be pooled for final statewide conclusions about accomplishment of objectives.

A prototypical summary of individual projects with project grades, final totals and calculation of the annual BDM grade is presented in Table 3-1. This prototypical program depicts the completion and scoring of 10 BDM programs during the year and indicates that eight of ten

programs received an “adequate(rating of 1)” from Cooperators and eight programs received an “adequate” rating as determined by WS calculations. Following the formula in the table, a final grade of 80% is derived. Since a grade of 51% was needed, the imaginary BDM program was successful in meeting objectives.

Table 3-1. Summary Of Prototypical Cooperative BDM Programs With Derived Grades And Calculated Score From Pooled Results For The Purpose Of Determining Success In Meeting Overall BDM Program Objectives

COOPERATIVE PROGRAMS	A	B	C
	COOPERATOR GRADE (0 or 1)	DAMAGE REDUCTION GRADE (0 or 1)	RESOURCES SAVED GRADE (0 or 1)
1. Agricultural Protection Program # 1	1	1	
2. Agricultural Protection Program # 2	0	1	
3. Human Health And Safety Protection Program # 1	1		1
4. Human Health And Safety Protection Program # 2	1	1	
5. Human Health And Safety Protection Program # 3	1	1	
6. Natural Resources Protection Program # 1	0		1
7. Natural Resources Protection Program # 2	1		0
8. Property Protection Program # 1	1	0	
9. Property Protection Program # 2	1		1
10. Property Protection Program # 3	1	1	
NUMERICAL TOTALS	8	5	3
FINAL SCORE IN PERCENT	$\frac{1/2A + 1/2(B+C)}{\# \text{ Programs}} \times 100 = \frac{4 + 4}{10} \times 100 = 80\%$		

4.0 CHAPTER 4: ALTERNATIVES INCLUDING THE PROPOSED ACTION

Alternatives analyzed in detail are:

- 1) Alternative 1 - Continue the Current Federal BDM Program. This is the Proposed Action as described in Chapter 1 and is the "No Action" alternative as defined by the Council on Environmental Quality for analysis of ongoing programs or activities.
- 2) Alternative 2 - Nonlethal BDM Only By WS
- 3) Alternative 3 - Technical Assistance Only. Under this alternative, WS would not conduct any direct operational BDM activities in Kentucky. If requested, affected requesters would be provided with technical assistance information only.
- 4) Alternative 4 - No Federal WS BDM. This alternative consists of no Federal BDM program by WS.

4.1 DESCRIPTION OF THE ALTERNATIVES

4.1.1 Alternative 1 - Continue the Current Federal BDM Program (No Action/Proposed Action)

The No Action alternative is a procedural NEPA requirement (40 CFR 1502), is a viable and reasonable alternative that could be selected, and serves as a baseline for comparison with the other alternatives. The No Action alternative, as defined here, is consistent with the Council on Environmental Quality's (CEQ's) definition (CEQ 1981).

The proposed action is to continue the current portion of the WS program in Kentucky that responds to requests for BDM to protect human health and safety, agricultural crops, turf, livestock feed, livestock, livestock health, property, threatened and endangered species, other wildlife, other natural resources, and aquaculture in the State of Kentucky. A major component of the current program consists of an Integrated Wildlife Damage Management (IWDM) approach to address human health and safety threats and property damage associated with large concentrations of birds at roosts and other sites at both public and private facilities in the State. The program would also operate to reduce or minimize the loss of livestock feed and the risk of bird-related livestock health problems presented by European starlings and blackbirds at requesting dairies and feedlots, and to meet requests to minimize damage or the risk of damage to agriculture, other wildlife species, or other resources caused by birds. To meet these goals WS would have the objective of responding to all requests for assistance with, at a minimum, technical assistance or self-help advice, or, where appropriate and when cooperative or congressional funding is available, direct damage management assistance in which professional WS Specialists or Wildlife Biologists conduct damage management actions. An IWDM approach would continue to be implemented which would allow use of any legal technique or method, used singly or in combination, to meet requester needs for resolving conflicts with birds. Agricultural producers and others requesting assistance would be provided with information regarding the use of effective nonlethal and lethal techniques. Lethal methods used by WS would include shooting, trapping, nest and/or egg destruction, DRC-1339 (Starlicide), Avitrol, or euthanasia following live capture by trapping, hand capture, nets, or use of the tranquilizer alpha-chloralose (A-C). Nonlethal methods used by WS may include pruning or thinning of trees, porcupine wire deterrents, wire barriers and deterrents, the tranquilizer A-C, live-capture by cages, nets, net guns, hand nets, drop nets, rocket nets, followed by translocation of captured birds, chemical repellents (e.g., methyl and di-methyl anthranilate, or anthraquinone), and harassment. In many situations, the

implementation of nonlethal methods such as exclusion-type barriers would be the responsibility of the requester which means that, in those situations, WS's only function would be to implement lethal methods if determined to be necessary. BDM by WS would be allowed in the State, when requested, on private property or public facilities where a need has been documented, upon completion of an *Agreement for Control*. All management actions would comply with appropriate Federal, State, and Local laws. Appendix B provides a more detailed description of the methods that could be used under the proposed action.

4.1.2 Alternative 2 - Nonlethal BDM Only By WS

This alternative would require WS to use nonlethal methods only to resolve bird damage problems. Persons receiving technical assistance could still resort to lethal methods that were available to them. Currently, DRC-1339 and alpha-chloralose are only available for use by WS employees. Therefore, use of these chemicals by private individuals would be illegal. Appendix B describes a number of nonlethal methods available for use by WS under this alternative.

4.1.3 Alternative 3 - Technical Assistance Only

This alternative would not allow for WS operational BDM in Kentucky. WS would only provide technical assistance and make recommendations when requested. Producers, property owners, agency personnel, or others could conduct BDM using traps, shooting, Avitrol, or any nonlethal method that is legal. Avitrol could only be used by State certified pesticide applicators. Currently, DRC-1339 and alpha-chloralose are only available for use by WS employees. Therefore, use of these chemicals by private individuals would be illegal. Appendix B describes a number of methods that could be employed by private individuals or other agencies after receiving technical assistance advice under this alternative.

4.1.4 Alternative 4 - No Federal WS BDM

This alternative would eliminate Federal involvement in BDM in Kentucky. WS would not provide direct operational or technical assistance and requesters of WS services would have to conduct their own BDM without WS input. Information on BDM methods would still be available to producers and property owners through such sources as USDA Agricultural Extension Service offices, universities, or pest control organizations. DRC-1339 and alpha-chloralose are only available for use by WS employees. Therefore, use of these chemicals by private individuals would be illegal. Avitrol could be used by State certified restricted-use pesticide applicators.

4.2 BDM STRATEGIES AND METHODOLOGIES AVAILABLE TO WS IN KENTUCKY

The strategies and methodologies described below include those that could be used or recommended under Alternatives 1, 2 and 3 described above. Alternative 4 would terminate both WS technical assistance and operational BDM by WS. Appendix B is a more thorough description of the methods that could be used or recommended by WS.

4.2.1 Integrated Wildlife Damage Management (IWDM)

The most effective approach to resolving wildlife damage is to integrate the use of several methods simultaneously or sequentially. The philosophy behind IWDM is to implement the best combination

of effective management methods in a cost-effective² manner while minimizing the potentially harmful effects on humans, target and nontarget species, and the environment. IWDM may incorporate cultural practices (e.g., animal husbandry), habitat modification (e.g., exclusion), animal behavior modification (e.g., scaring), removal of individual offending animals, local population reduction, or any combination of these, depending on the circumstances of the specific damage problem.

4.2.2 The IWDM Strategies That WS Employs

4.2.2.1 Technical Assistance Recommendations

“Technical assistance” as used herein is information, demonstrations, and advice on available and appropriate wildlife damage management methods. The implementation of damage management actions is the responsibility of the requester. In some cases, WS provides supplies or materials that are of limited availability for non-WS entities to use. Technical assistance may be provided through a personal or telephone consultation, or during an on-site visit with the requester. Generally, several management strategies are described to the requester for short and long-term solutions to damage problems; these strategies are based on the level of risk, need, and the practicality of their application.

Under APHIS NEPA Implementing regulations and specific guidance for the WS program, WS technical assistance is categorically excluded from the need to prepare an EA or EIS. However, it is discussed in this EA because it is an important component of the IWDM approach to resolving bird damage problems.

4.2.2.2 Direct Damage Management Assistance

This is the conduct or supervision of damage management activities by WS personnel. Direct damage management assistance may be initiated when the problem cannot effectively be resolved through technical assistance alone, and when *Agreements for Control* or other comparable instruments provide for direct damage management by WS. The initial investigation defines the nature, history, extent of the problem, species responsible for the damage, and methods that would be available to resolve the problem. Professional skills of WS personnel are often required to effectively resolve problems, especially if restricted use pesticides are necessary, or if the problems are complex.

4.2.2.3 Examples of WS Direct Operational and Technical Assistance in BDM in Kentucky.

Management of Hazards to Aircraft and Air Passengers in Kentucky

WS participates with the Federal Aviation Administration under a MOU to provide information or services, upon request, to airports in Kentucky. Sometimes WS evaluates wildlife hazards at airports upon request, provides such airports with Wildlife Hazard Assessments which outline wildlife hazards found, and assists airports in developing Wildlife Hazard Management Plans to address wildlife threats. WS also sometimes assists airports in obtaining USFWS depredation permits for the purpose of managing hazard threats posed by migratory birds. IWDM strategies are employed and recommended for these facilities.

² The cost of management may sometimes be secondary because of overriding environmental, legal, human health and safety, animal welfare, or other concerns.

WS's current program utilizes two full-time and one part-time employees to conduct IWDM programs and to monitor wildlife hazards at airports to insure the protection of human lives and aircraft. In addition to direct operational activities consisting of various harassment, live capture with translocation, and lethal removal techniques aimed at potentially injurious wildlife, WS personnel provide ongoing technical advice to airport managers about how to reduce the presence of wildlife in airport environs. WS may also oversee various habitat management projects implemented by airport personnel in order to provide technical expertise about methods. In addition, WS promotes improved bird strike record keeping and maintains a program of bird identification and monitoring of bird numbers at participating airports.

WS may receive requests in the future from airports previously discussed, or any other airports in Kentucky, for assistance in resolving wildlife hazards to aviation. WS may provide technical assistance and / or direct operational assistance using any combination of approved methods discussed in this EA which are appropriate for use in airport environments.

Feral Domestic Pigeon Problems

Feral domestic pigeons are responsible for the majority of nuisance bird damage and human health and safety requests for assistance in Kentucky. The most common situation with this species involves pigeons roosting and nesting on buildings and structures. The main problem is from the birds' droppings which cause concerns for diseases associated with bird droppings in Kentucky, and an unsightly mess, and result in clean-up costs. These problems are frequently addressed by recommending exclusion devices/barriers (such as netting, hardware cloth, screen, porcupine wire) or habitat modification and local population reduction. Methods that could be used for population reduction include shooting with pellet rifles, low-velocity .22 caliber rifle rounds (that shoot bullets at about the same velocity as a pellet rifle), shotguns (mostly in rural or semi-rural situations), live capture with cage traps followed by euthanasia, DRC-1339 baiting, or Avitrol.

WS has been requested in the past to manage damage caused by feral domestic pigeons through direct operational projects. These projects have included activities to reduce local pigeon numbers in or at several cities and facilities around the State. WS expects to receive future requests from entities presently or previously assisted, as well as other entities across the State and could respond with technical assistance, direct operational assistance, or a combination of both in any situation in the State.

Management of Damage Caused by Urban Waterfowl

Canada geese and mallard ducks (*Anas platyrhynchos*) have populations in most major cities in Kentucky. These species concentrate in areas where water is available such as swimming pools, various sized ponds and small lakes at business parks, golf courses, city, county and state parks, lakes owned and operated by homeowner associations in large subdivisions, and city water source reservoirs. Mating birds usually are implicated in the greatest damage losses, because they spend longer periods at a damage site than itinerant and migratory birds, and parents and their young may use the same site late in the season and in recurrent years. WS responded to 126 calls for assistance with damage caused by waterfowl during FY 1997-99. Assistance was provided for threats to human health and safety, property damage, and nuisance problems associated with waterfowl. Many of these calls are handled through technical assistance provided as advisory leaflets, or more specific recommendations resulting from visits by WS to damage sites. Normally, complainants are advised to use strategies which combine harassment with environmental manipulation such as netting, grid

wire exclusion systems and changing the vegetation to deter nesting. In some situations, elimination of water bodies is recommended. If non-lethal strategies are unsuccessful, WS may sometimes recommend a USFWS depredation permit be granted to the requester for nest and egg destruction or egg addling. A major component of waterfowl damage management in Kentucky includes a live-capture and translocation program provided by WS for a fee to those requesting direct assistance. In these programs WS may use corral-capture, net guns, rocket nets, hand nets, hand capture, cage traps, drop nets, or alpha-chloralose to live capture birds which are then translocated to wild sites and released. In instances where human health and safety threats cannot be resolved through non-lethal methods, selective lethal removal of a few waterfowl could be performed. This method may also be used to reinforce harassment programs where human health and safety or agricultural losses are a factor and would usually result in the selective removal of a few birds.

WS may receive requests for assistance in managing damage caused by urban waterfowl from Federal, State or Local government agencies, businesses, or private individuals in Kentucky in the future. WS may provide technical or direct operational assistance to requesters in an effort to resolve damage problems caused by waterfowl. IWDM strategies will be recommended by WS, and direct operational assistance could include any of the methods previously discussed.

Vulture Damage Management

Both turkey and black vultures inhabit Kentucky and are present most of the year. Vultures usually congregate into roosting and loafing flocks in areas of Kentucky that have fairly large tracts of woodland, primarily mature oak and hickory stands. Many such sites are located near recreational lakes. These birds damage roofs and weather stripping on houses and if congregating near lake sites where boats and pontoon are located will destroy canopies, roofs, seats, and trim on these recreational craft. In addition, WS receives calls occasionally from cattle producers who request assistance with vultures which are preying on newborn calves or pigs. Other problems associated with large vulture flocks in Kentucky include power disruption and damage to equipment at power generating facilities and defacing of historic sites such as cemeteries. Requesters seeking help reported more than \$93,500 in damage during FY 1997-99. In addition, many people expressed concerns for sanitation and possible disease threats from dropping deposits left by vulture flocks, for which no dollar value could be attached.

During FY 1997-99, WS responded to 37 requests for assistance with problem vulture flocks. Most of the requests were handled through technical assistance. In some instances where individuals suffering damage used non-lethal techniques such as noise harassment to scare the birds away without success, WS made recommendations to USFWS that depredation permits be provided to those who applied. The permits would allow property owners to lethally remove 10% or less of the offending birds to reinforce other harassment efforts. In some instances, property owners asked for direct operational assistance.

During FY 1997-99, 81 direct assistance activities were conducted by WS to address vulture damage in Kentucky. These activities included the use of visual, vehicle, and pyrotechnic harassment, and other noise harassment, and in some cases, harassment shooting of minimum numbers of birds at a project site to reinforce noise harassment. More than 1758 vultures were addressed during that period of time in direct assistance projects conducted by WS. Less than 6% of this number was actually killed, and remaining birds were dispersed.

WS may be requested to provide assistance to property owners or managers, livestock producers, or local health officials to address problems caused by vultures. This assistance may be provided under any conditions previously mentioned or under similar conditions where agriculture, natural resources,

other wildlife, property, or human health and safety are at risk. IWDM strategies would be used or recommended by WS to address problems associated with vulture flocks in Kentucky.

Management of Damage Caused by Colonial Nesting Waterbirds

Colonial nesting waterbirds in Kentucky include great blue herons (*Ardea herodias*), black-crowned night herons (*Nycticorax nycticorax*), and yellow-crowned night herons (*Nycticorax violaceus*). While nesting waterbirds are known to cause damage by predation to aquaculture facilities (Salmon and Conte, 1981, Schaeffer, 1992), in some situations in Kentucky, other localized problems are associated with these birds. For instance, a rookery (nesting colony) of black-crowned night herons located near a public use facility in Kentucky began to cause damage to the facilities resources and created extremely messy conditions in areas where visitors traveled and where the company's resources were housed. Dropping deposits and regurgitation of fish remains caused sanitation and disease concerns and caused very objectionable odors to employees and patrons. During FY 1997-99 nesting herons caused \$11,740 in damage to that facility in the form of both direct losses and costs for methods to address the problem. In addition, these birds began nesting in residential areas around the facility, and during FY 1999, \$1,450 in damage was reported to WS from requesters in these areas as they sought solutions to the problem (USDA-WS MIS Database).

WS provided both technical and direct operational assistance to the public use facility and some residents in the area from FY 1994-99. In these activities environmental manipulation and other resource protection strategies were recommended by WS and some were implemented by the facility. However, by FY 1995, these methods were not solving damage problems and WS recommended a USFWS permit be granted to the facility to allow nest and egg destruction on the property. Damage continued and in FY 1996 WS was requested to conduct a direct operational program in which WS would continue nest and egg destruction activities and habitat alteration (pruning and cutting of trees) strategies to discourage use of the property by the birds. During FY 1996-98 damage was greatly reduced on the property. During FY-1998-99 WS also conducted limited but similar direct operations for a few residents in the vicinity of the facility, thus reducing damage at a few residential sites. During the spring of 1999, when nestlings began to hatch in established night heron nests, WS consulted with the Kentucky Nature Preserves Commission about the status of the heron colony in Louisville and agreed to cease nest and egg destruction at any sites for the remainder of the year. At that time WS began recommending that complainants who sought assistance not disturb nests, but prepare to conduct harassment activities the following year to address any attempts by this species to nest in the problem areas.

During FY 1994-99 only three black-crowned night herons were killed during all activities. These were fledglings which accidentally fell from nests during tree pruning operations conducted by WS. In connection with these activities, employees of the affected facility and WS recovered 48 nestlings which were rehabilitated. Forty-six of these birds were able to be released back into the wild. Remaining birds which were not judged capable of surviving in the wild were placed in zoo exhibits. WS may receive requests to address human health and safety issues, disease threats to other species, or property damage related to colonial nesting water birds in Kentucky at the aforementioned facility, adjacent residential areas, or any other areas in Kentucky. WS may provide technical or direct operational assistance to requesters. Methods used or recommended by WS would be IWDM strategies, which might include both approve lethal and non-lethal methods.

4.2.3 WS Decision Making

WS personnel use a thought process for evaluating and responding to damage complaints that are

depicted by the WS Decision Model described by Slate et al., in 1992 (Figure 4-1). WS personnel are frequently contacted after requesters have tried or considered nonlethal methods and found them to be impractical, too costly, or inadequate for acceptably reducing damage. WS personnel assess the problem, evaluate the appropriateness and availability (legal and administrative) of strategies and methods based on biological, economic and social considerations. Following this evaluation, methods deemed to be practical for the situation are incorporated into a management strategy. After this strategy has been implemented, monitoring is conducted and evaluation continues to assess the effectiveness of the strategy. If the strategy is effective, the need for further management is ended. In terms of the WS Decision Model (Slate et al. 1992), most damage management efforts consist of continuous feedback between receiving the request and monitoring the results of the damage management strategy. The Decision Model is not a documenting process, but a mental problem-solving process common to most if not all professions.

4.2.4 Bird Damage Management Methods Available for Use. (See Appendix B)

4.2.4.1 Nonchemical, Nonlethal Methods (See Appendix B for detailed descriptions)

Agricultural producer and property owner practices consist primarily of nonlethal preventive methods such as **cultural methods³** and **habitat modification**.

Animal behavior modification refers to tactics that alter the behavior of birds to reduce damages. Some but not all of these tactics include the following:

- Exclusions such as netting
- Propane exploders (to scare birds)
- Pyrotechnics (to scare birds)
- Distress calls and sound producing devices (to scare birds)
- Visual repellents and scaring tactics

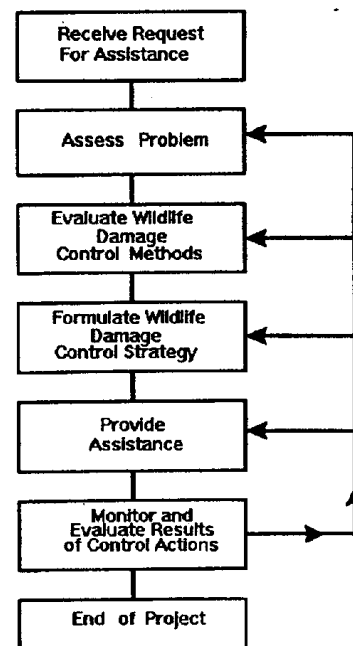
Relocation or dispersal of damaging birds to other areas

Nest destruction of the target species before eggs or young are in the nest

Habitat/environmental modification to attract or repel certain bird species

Live traps are various types of traps designed to capture birds alive for relocation or euthanasia.

Figure 4-1. APHIS, WS Decision Model



³ Generally involves modifications to the management of protected resources to reduce their vulnerability to wildlife damage..

Some examples are clover traps, decoy traps, nest box traps, mist nets, corrals, etc.

Lure crops/alternate foods are crops planted or other food resources provided to mitigate the potential loss of higher value crops.

4.2.4.2 Chemical, Nonlethal Methods (See Appendix B for detailed descriptions and Appendix E for EPA labels and MSDS)

Avitrol is a chemical frightening agent registered for use on pigeons, crows, gulls, blackbirds, European starlings, and English sparrows in various situations. This chemical works by causing distress behavior in the birds that consume treated baits from a mixture of treated and untreated bait, which generally frightens the other birds from the site. Generally birds that eat the treated bait will die (Johnson and Glahn 1994).

Alpha-chloralose is used as an immobilizing agent, which is a central nervous system depressant, and used to capture waterfowl or other birds. It is generally used in recreational and residential areas, such as swimming pools, shoreline residential areas, golf courses, or resorts. Alpha-chloralose is typically delivered as a well-contained bait in small quantities with minimal hazards to pets and humans; single baits consisting of bread or corn are fed directly to the target birds.

Methyl Anthranilate (MA) and **Di-methyl Anthranilate** (artificial grape flavoring food additive) has been shown to be an effective repellent for many bird species, including waterfowl. It can be applied to turf or surface water or as a fog to repel birds from small areas. It may also become available for use as a livestock feed additive that has bird repellent value.

Other repellents: Other bird repellents that might become available include anthraquinone (Avery et al. 1997) and charcoal particles (e.g., adhered to livestock feed).

4.2.4.3 Mechanical, Lethal Methods (See Appendix B for detailed descriptions)

Egg addling/oiling/destruction is the practice of destroying the embryo in the egg prior to hatching; physically breaking eggs; or directly removing eggs from a nest and destroying them.

Decoy and nest box traps are sometimes used by WS to capture blackbirds and European starlings. Decoy traps are set in limited numbers in selected locations where a resident population is causing localized damage or where other techniques cannot be used. Decoy traps are similar in design to the Australian Crow Trap as reported by Johnson and Glahn (1994) and McCracken (1972). Live decoy birds are placed in the trap with sufficient food and water to assure their survival. Feeding behavior and calls of the decoys attract other birds into the trap. Blackbirds and European starlings taken in these traps are euthanized.

Shooting is more effective as a dispersal technique than as a way to reduce European starling or blackbird numbers. The number that can be killed by shooting is generally very small in relation to the number involved in damage situations. Usually only a few dozen birds can be shot from individual flocks that can number anywhere from a few hundred to many thousands or hundreds of thousands before the rest of the birds become gun shy. Shooting, however, can be helpful in some situations to supplement and reinforce other dispersal techniques. It is selective for target species and may be used in conjunction with the use of spotlights, decoys, and calling. Shooting with rifles, shotguns, or pellet guns (rifles or pistols) is sometimes used to manage bird damage problems when

lethal methods are determined to be appropriate. The birds are killed as quickly and humanely as possible.

Sport hunting can be part of a BDM strategy to enhance the effectiveness of harassment techniques. For example, WS sometimes directs sport hunters to contact KDFWR about areas where Canada geese causing damage may be hunted.

Snap traps are modified rat traps that are used to remove individual birds such as woodpeckers causing damage to buildings.

4.2.4.4 Chemical, Lethal Methods (See Appendix B for detailed descriptions)

DRC-1339 is a slow acting avicide for reducing damage from several species of birds, including blackbirds, European starlings, pigeons, crows, ravens, magpies, and gulls. DRC-1339 is highly toxic to sensitive species but only slightly toxic to nonsensitive birds, predatory birds and mammals. This chemical would be the primary lethal chemical method used for feral domestic pigeon, starling, and blackbird damage management under the current program.

Carbon dioxide (CO₂) gas is an American Veterinary Medical Association (AVMA) approved euthanasia method which is sometimes used to euthanize birds which are captured in live traps or by chemical immobilization and when relocation is not a feasible option. Live birds are placed in a container or chamber into which CO₂ gas is released. The birds quickly expire after inhaling the gas.

4.2.4.5 Mechanical, Lethal Methods (See Appendix B for detailed descriptions)

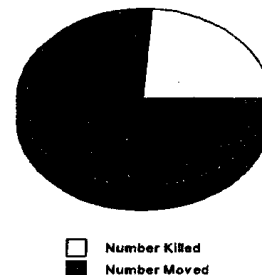
4.2.5 ALTERNATIVE 2 - Nonlethal BDM Only By WS

This alternative would require that WS only utilize nonlethal methods in addressing bird damage problems. Historically, in Kentucky, WS's activities in resolving blackbird and starling damage have been more than 70% nonlethal (Fig. 3-2). For example, for the 3-year period of FY 1997- 99, the number of blackbirds and European starlings killed by WS personnel in Kentucky was 309,421, while the number dispersed through various harassment projects totaled an estimated 977,504 (Figure 3-2). For other types of BDM problems, producers, State agency personnel, or others could conduct BDM activities including the use of traps, shooting, and any lethal or nonlethal methods they deem effective. However, DRC-1339 and alpha-chloralose are currently only available for use by WS employees. Therefore use of these chemicals by private individuals would be illegal and private and commercial applicators would be left only with using other alternatives such as Avitrol if chemical control was needed.

4.2.6 ALTERNATIVE 3 - Technical Assistance Only

This alternative would not allow WS operational BDM in the State. WS would only provide technical assistance and make recommendations when requested. Producers, State agency personnel, or others could conduct BDM activities including the use of traps, shooting, and any lethal or nonlethal methods they deem effective. However, DRC-1339 and alpha-chloralose are currently only available for use by WS employees. Therefore use of these chemicals by private individuals would be illegal

Figure 4-2. Numbers of Blackbirds and European Starlings Killed vs. The Number Moved or Dispersed Via Nonlethal Means by WS FY 1997-99.



and private and commercial applicators would be left only with using other alternatives such as Avitrol if chemical control was needed.

4.2.7 ALTERNATIVE 4 - No Federal WS Bird Damage Management

This alternative would consist of no Federal involvement in B.M. in the State -- neither direct operational damage management assistance nor informational/advisory technical assistance would be employed by WS. Information on future developments in nonlethal and lethal management techniques that culminate from research efforts by WS's research branch would still be available to affected resource owners or managers. However, the Kentucky WS program would not be a direct source of such information. Producers, State agency personnel, or others would be left with the option to conduct BDM activities including the use of traps, shooting, and any lethal or nonlethal methods they deem effective with the exception of DRC-1339 and Alpha-chloralose which are currently only available for use by WS employees. Therefore use of these chemicals by private individuals would be illegal and private and commercial applicators would be left only with using other alternatives such as Avitrol if chemical control was needed.

4.3 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL WITH RATIONALE

Several alternatives were considered, but not analyzed in detail. These were:

4.3.1 Lethal BDM Only By WS

Under this alternative, WS would not conduct any nonlethal control of birds for BDM purposes in the State, but would only conduct lethal BDM. This alternative was eliminated from further analysis because some bird damage problems can be resolved effectively through nonlethal means. For example, a number of damage problems involving the encroachment of injurious birds into buildings can be resolved by installing barriers or repairing of structural damage to the buildings, thus excluding the birds. Further, such damage situations as immediately clearing a runway of a large flock of injurious birds could not be implemented immediately, while scaring them away through noise harassment might resolve the air passengers' threat at once. In addition, a lethal-only program does not satisfy wildlife management objectives of KDFWR in some instances, and do not meet lethal standard conditions of USFWS.

4.3.2 Compensation for Bird Damage Losses

The Compensation alternative would require the establishment of a system to reimburse persons impacted by bird damage. This alternative was eliminated from further analysis because no Federal or State laws currently exist to authorize such action. Under such an alternative, WS would not provide any direct control or technical assistance. Aside from lack of legal authority, analysis of this alternative in the FEIS indicated that the concept has many drawbacks (USDA 1994):

- It would require larger expenditures of money and labor to investigate and validate all damage claims, and to determine and administer appropriate compensation. A compensation program would likely cost several times as much as the current program. In Kentucky, damage reported to WS by all species of damaging animals exceeded \$1.1 million during FY 1999, yet the current WS program of abating such damage only costs about \$380,000 per year. In addition, damage reported as \$1.1 million for Kentucky was actually far less than occurred in reality, since only

\$100,000 in costs related to human health and safety were derived, because of the difficulty of determining such damage values.

- Compensation would most likely be below full market value. It is difficult to make timely responses to all requests to assess and confirm damage, and certain types of damage could not be conclusively verified. For example, it would be impossible to prove conclusively in individual situations that birds were responsible for disease outbreaks even though they may actually have been responsible. Thus, a compensation program that requires verification would not meet its objective for mitigating such losses.
- Compensation would give little incentive to resource owners to limit damage through improved cultural, husbandry, or other practices and management strategies.
- Not all resource owners would rely completely on a compensation program and unregulated lethal control would most likely continue as permitted by State law.
- Compensation would not be practical for reducing threats to human health and safety.

4.3.3 Short Term Eradication and Long Term Population Suppression

An eradication alternative would direct all WS program efforts toward total long term elimination of bird populations on private, State, Local and Federal government lands wherever a cooperative program was initiated in the State.

In Kentucky, eradication of native bird species (the starling, English sparrow, and feral domestic pigeon are not native to North America) is not a desired population management goal of State agencies. Although generally difficult to achieve, eradication of a local population of feral domestic pigeons or European starlings may be the goal of individual BDM projects in fulfillment of Executive Order 13112 On Invasive Species (see Subsection 1.7.2.7). This is because feral domestic pigeons and European starlings are not native to North America and are only present because of human introduction. However, eradication as a general strategy for managing bird damage will not be considered in detail because:

- All State and Federal agencies with interest in, or jurisdiction over, wildlife oppose eradication of any native wildlife species.
- Eradication is not acceptable to most people.
- Because blackbirds and European starlings are migratory and most winter populations in Kentucky may be comprised in part of winter migrants from northern latitudes, eradication would have to be targeted at the entire North American populations of these species to be successful. That would not be feasible or desirable.

Suppression would direct WS program efforts toward managed reduction of certain problem populations or groups. In areas where damage can be attributed to localized populations of birds, WS can decide to implement local population suppression as a result of using the WS Decision Model. Problems with the concept of suppression are similar to those described above for eradication.

It is not realistic or practical to consider large-scale population suppression as the basis of the WS program. Typically, WS activities in the State would be conducted on a very small portion of the sites or areas inhabited or frequented by problem species.

4.3.4 Use of Bird-proof Feeders in Lieu of Lethal Control at Dairies and Cattle Feeding Facilities

A method proposed by Animal Protection of New Mexico, Inc. for excluding birds at dairies and cattle feeding facilities in that State, is a "bird-proof" feeder that involves the installation of 1/8" thick steel panel feed troughs covered by parallel 4-6 inch spaced steel cables or wires running from the outer top edge of the trough up at a 30-45 degree angle to the top of the head chutes that cattle use to access the feed. Vertical canvas strips are hung from the cables. The feeder was reportedly designed for use with horses. A copy of a diagram of this system was sent to Mr. Jim Glahn, Bird Control Research Biologist, National Wildlife Research Center (NWRC), who has nearly 12 years of experience researching problems caused by European starlings at livestock feeding operations, and to the Extension Wildlife Specialist and Livestock Specialist at New Mexico State University (Dr. John Boren, Dr. Ron Parker, NMSU Coop. Ext. Service, Pers. Comm. 1999) for opinions regarding the potential effectiveness and practicality of the feeder. Concerns expressed were:

- no efficacy data were available on the effectiveness of the design in excluding European starlings and blackbirds. Unresolved concerns were that the cables could provide temporary perching sites for the birds and that birds might enter the trough from the rear where the cows insert their heads through the chutes to access feed (Boren and Parker).
- a major flaw in the design is the spacing of the cables at 4-6" which would allow European starlings to drop through. Reducing the spacing to 2" as recommended by Johnson and Glahn (1994) would likely interfere with the delivery of feed to the troughs. This is because the feed mixture currently used by most dairies is a mixture of chopped alfalfa hay and corn silage with a grain component. The alfalfa/corn silage portion would likely hang up on the cable or wire strands of the troughs and much would fall outside the troughs, with increased feed waste a result (Glahn).
- the spacing of the canvas strips is not specified, and canvas would deteriorate quickly from cattle licking and weather (Glahn).
- altering from an open platform feeding system to enclosed troughs would pose problems with removal of rejected or spoiled feed. The troughs would likely require substantial increases in manual labor to clean versus the current method of using a tractor-mounted blade or front-end loader (Boren and Parker; Glahn).
- the cable/wire barriers would likely hinder the application of injectable medicines which is currently achieved by use of the "lockup" feeding chutes that restrain the cows by the head and neck for this purpose (Boren and Parker).
- feed consumption might be reduced, at least temporarily, due to reluctance of cows to put their heads into a semi-enclosed environment (Boren and Parker).
- the conversion to the suggested feed trough design would likely be substantial. Most dairy/feedlot managers would be reluctant to convert considering initial cost and the added inconveniences discussed above (Boren and Parker).

Dr. Boren and Dr. Parker suggested that, at a minimum, a replicated field study should be conducted to address these concerns before such a system is implemented. Mr. Glahn expressed the opinion,

based on Twedt and Glahn (1982) and Feare (1984), that exclusion methods to reduce starling depredations at livestock feeding operations are usually the least cost-effective solution.

Despite the above concerns about the bird-proof feeder system recommended by APNM, Inc., similar type systems could be recommended by WS under the current program should any become available that are effective, practical, and economically feasible for producers to implement.

4.4 MITIGATION AND STANDARD OPERATING PROCEDURES FOR BIRD DAMAGE MANAGEMENT TECHNIQUES

4.4.1 Mitigation in Standard Operating Procedures (SOPs)

Mitigation measures are any features of an action that serve to prevent, reduce, or compensate for effects that otherwise might result from that action. The current WS program, nationwide and in Kentucky, uses many such mitigation measures and these are discussed in detail in Chapter 5 of the FEIS (USDA 1994). Some key mitigating measures pertinent to the proposed action and alternatives that are incorporated into WS's Standard Operating Procedures include:

- The WS Decision Model thought process which is used to identify effective wildlife damage management strategies and their effects.
- Reasonable and prudent measures or alternatives are identified through consultation with the USFWS and are implemented to avoid effects to T&E species.
- EPA-approved label directions are followed for all pesticide use. The registration process for chemical pesticides is intended to assure minimal adverse effects to the environment when chemicals are used in accordance with label directions.
- All WS Specialists in the State who use restricted chemicals are trained and certified by, or else operate under the direct supervision of, program personnel or others who are experts in the safe and effective use of chemical BDM materials.
- The presence of nontarget species is monitored before using DRC-1339 to control European starlings and blackbirds at feedlots to reduce the risk of significant mortality of nontarget species populations.
- Research is being conducted to improve BDM methods and strategies so as to increase selectivity for target species, to develop effective nonlethal control methods, and to evaluate nontarget hazards and environmental effects.

Some additional mitigating factors specific to the current program include:

- Management actions would be directed toward localized populations or groups of target species and/or individual offending members of those species. Generalized population suppression across the State, or even across major portions of the State, would not be conducted.
- WS uses BDM devices and conducts activities for which the risk of hazards to public safety and hazard to the environment have been determined to be low according to a formal risk assessment (USDA 1994, Appendix P). Where such activities are conducted on private lands or other lands of restricted public access, the risk of hazards to the public is even further reduced.

4.4.2 Additional Mitigation Specific to the Issues

The following is a summary of additional mitigation measures that are specific to the issues listed in Chapter 2 of this document.

4.4.2.1 Effects on Target Species Populations

- BDM activities are directed to resolving bird damage problems by taking action against individual problem birds, or local populations or groups, not by attempting to eradicate populations in the entire area or region.
- WS take is monitored by comparing numbers of birds killed by species or species group (e.g., blackbirds) with overall populations or trends in populations to assure the magnitude of take is maintained below the level that would cause significant adverse effects to the viability of native species populations (See Chapter 5).

4.4.2.2 Effects on Nontarget Species Populations Including T&E Species

WS personnel are trained and experienced to select the most appropriate method for taking problem animals and excluding nontargets.

- Observations of birds feeding at feedlots, dairies, or blackbird/European starling staging areas, or of birds that are associated with feral domestic pigeon concentrations are made to determine if nontarget or T & E species would be at risk from BDM activities.
- WS has consulted with the USFWS regarding potential effects of control methods on T&E species, and abides by reasonable and prudent alternatives (RPAs) and/or reasonable and prudent measures (RPMs) established as a result of that consultation. For the full context of the Biological Opinion see the ADC FEIS, Appendix F (USDA 1994). Further consultation on species not covered by or included in that formal consultation process will be initiated with the USFWS and WS will abide by any RPAs, RPMs, and terms and conditions that result from that process to avoid jeopardizing any listed species.
- WS uses chemical methods for BDM that have undergone rigorous research to prove their safety and lack of serious effects on nontarget animals and the environment.

5.0 CHAPTER 5: ENVIRONMENTAL CONSEQUENCES

Chapter Five provides information needed for making informed decisions in selecting the appropriate alternative for meeting the purpose of the proposed action. The chapter analyzes the environmental consequences of each alternative in relation to the issues identified for detailed analysis in Chapter 2. This section analyzes the environmental consequences of each alternative in comparison with the proposed action to determine if the real or potential effects would be greater, lesser, or the same. Therefore, the proposed action or current program alternative serves as the baseline for the analysis and the comparison of expected effects among the alternatives. The background and baseline information presented in the analysis of the current program alternative thus also applies to the analysis of each of the other alternatives.

The following resource values within the State are not expected to be significantly impacted by any of the alternatives analyzed: soils, geology, minerals, water quality/quantity, floodplains, wetlands, visual resources, air quality, prime and unique farmlands, aquatic resources, timber, and range. These resources will not be analyzed further.

Cumulative Effects: Discussed in relationship to each of the alternatives analyzed, with emphasis on potential cumulative effects from methods employed, and including summary analyses of potential cumulative impacts to target and nontarget species, including T & E species.

Irreversible and Irretrievable Commitments of Resources: Other than minor uses of fuels for motor vehicles and other materials, there are no irreversible or irretrievable commitments of resources.

Effects on sites or resources protected under the National Historic Preservation Act: WS BDM actions are not undertakings that could adversely affect historic resources (See Section 1.7.2.5).

5.1 ENVIRONMENTAL CONSEQUENCES FOR ISSUES ANALYZED IN DETAIL

5.1.1 Effects on Target Species Bird Populations

5.1.1.1 Alternative 1. - Continue the Current Federal Bird Damage Management Program (The Proposed Action as Described in Chapter 1)

Analysis of this issue is limited primarily to those species most often killed during WS BDM. The analysis for magnitude of impact generally follows the process described in Chapter 4 of USDA (1994). Magnitude is described in USDA (1994) as "... *a measure of the number of animals killed in relation to their abundance.*" Magnitude may be determined either quantitatively or qualitatively. Quantitative determinations are based on population estimates, allowable harvest levels, and actual harvest data. Qualitative determinations are based on population trends and harvest data when available. Generally, WS only conducts damage management on species whose population densities are high and usually only after they have caused damage. Table 5-1 shows the numbers of birds killed by species and method as a result of WS BDM activities in Kentucky from FY 1997 through FY 1999.

European Starling and Blackbird Population Effects

Colonization of North America by the European Starling began on March 6, 1890 when 80 European starlings were released into New York's Central Park by a Mr. Eugene Scheiffelin, a member of the Acclimatization Society. The birds thrived and exploited their new habitat. By 1918, the advance

Table 5-1. Birds Killed By WS Through All Methods, And Eggs Destroyed, In Kentucky For Bird Damage Management In FY 97, 98, 99.

FY	Species	Damage Management Methods										Eggs Destroyed
		Alpha Chloralose ¹	DRC-1339	Avitrol	Raptor Trap	Cage Trap	Shooting	Harassment / Shooting	Corral	Mist Net	Hand Caught	
1997	Mourning Dove					9	176	490			78	
	Dab. Ducks							4				
	Feral Ducks								10			
	Canada Geese						7	6				
	Feral Geese								55			
	Common Grackles					4	6					
	RgB Gulls						6					
	Other Hawk						1					
	Red-tailed Hawks				1		15	1				
	A. Kestrels				5		27	7				
	Killdeer						51	83			8	
	Horned Larks							2B				
	Mallards						15	19				
	E. Meadowlarks						5	4				
	Feral Pigeons		2,004			185	704				78	
	A. Robin							1				
	Other Shorebirds						6					
	H/E Sparrows			30				54				
	E. Starlings		214,539	2			360	334			20	
	Turkey Vultures						12	11				

FY	Species	Damage Management Methods									
1998	Mixed-species Blackbird		30								
	Red-winged Blackbirds					15	21				
	BH Cowbirds						126				
	A. Crows		200			7	5				
	M. Dove				15	131	496				
	Dab. Ducks						2				
	Feral Ducks	5						10		6	
	Canada Geese					9	46				
	Feral Geese	15						55		2	
	Red-shouldered Hawks					1					
	Red-tailed Hawks			1		27	8				
	A. Kestrels			6		15	4				
	Killdeer					60	211			8	
	Horned Larks						2				
	Mallards					20	24				
	Mallards	7A									
	E. Meadowlarks					2	10				
	Feral Pigeons		3,501		423	1257	704			2	
	A. Robins						6				
	H/E. Sparrows					73			3		
	E. Starlings		61,184			423	754			8	
	Black Vultures						6				
	Mixed Vultures						23				
	Turkey Vultures						14				

FY	Species	Damage Management Methods										
1999	Mixed-species Blackbirds		1,025			5						
	Red-winged Blackbirds		1,322				33	13				
	BH Cowbirds						3	25				
	A. Crows		10B				2	3				
	Mourning Doves						116	308				
	Dab. Ducks							4				
	Diving Ducks						1					
	House Finch						1					
	Canada Geese	1					4	15				
	RgB Gulls							26				
	Great Blue Heron						1					
	Other Hawk						1					
	Red-tailed Hawks				2		23	4				
	A. Kestrels				47		11	6				
	Killdeer						40	62				
	Horned Larks						6	15				
	Mallards						14	44				
	E. Meadowlarks				21		7	18				
	Other Owl							1				
	Feral Pigeons		4,182			1,696	1,602	409			3	
	H/E Sparrows			275				184		1		
	E. Starlings		24,000	100			436	869				
	E. Starlings			20C								
	Mixed Vultures							16				
TOTAL BIRDS KILLED BY METHOD (DURING 3 CONCURRENT FISCAL YEARS)		21	311,997	427	83	2,124	5,732	5,500	130	4	213	

A Birds reported as killed were due to accidental mortalities or euthanasia because of injury, or associated with live-capture by alpha-chloralose.

B Other Unintentional Take

C Non-target Take

line of migrant juveniles extended from Ohio to Alabama; by 1926 from Illinois to Texas; by 1941 from Idaho to Kentucky; and by 1946 to California and Canadian coasts (Miller 1975). In just 50 short years the starling had colonized the United States and expanded into Canada and Mexico and 80 years after the initial introduction had become one of the most common birds in North America (Feare 1984).

Precise counts of blackbird and starling populations do not exist but one estimate placed the United States summer population of the blackbird group at more than one billion (USDA 1994) and the winter population at 500 million (Royal 1977). The majority of these birds occur in the eastern U.S.; for example surveys in the southeastern part of the country estimated 350 million blackbirds and European starlings in winter roosts (Bookhout and White 1981). Meanley and Royal (1976) estimated 538 million blackbirds and European starlings in winter roosts across the country during the winter of 1974-75. Of this total 74%, or 259 million of these birds were in the east.

An extensive population survey by Dolbeer and Stehn published in 1979 showed that, in the southeastern U.S., the number of breeding European starlings increased between 1966 and 1976. Breeding Bird Survey (BBS) data from Sauer et al. 1999 indicate an increase in the European starling breeding population in the U.S., a slight decrease in the eastern BBS region, and an increase in Kentucky, from 1966 -1999. Red-winged blackbirds, brown-headed cowbirds, and common grackles showed a slight decrease in population nationwide, in the eastern BBS region and Kentucky for the same period.

The nationwide starling population has been estimated at 140 million (Johnson and Glahn 1994). The winter starling population in the eastern U. S. was estimated by Meanley and Royall (1976) to be more than 87 million. The eastern U. S. population of the remaining blackbird group was estimated at 285.5 million.

All of the above information suggests that populations of European starlings and blackbirds have been relatively stable in recent years. For most species that show upward or downward trends, such trends have been relatively gradual. Additionally, blackbird populations are healthy enough, and the problems they cause are extensive enough, that the USFWS has established a standing depredation order for use by the public. Under this "order" (50 CFR 21.43), no Federal permit is required by anyone to remove blackbirds if they are committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance.

During FY 1997 - 99, Kentucky WS took 2,628 blackbirds (including common grackles and brown-headed cowbirds) at all project sites in the State in all damage situations. During the same period in Kentucky, WS killed 308,049 European starlings during all program activities in Kentucky. This is an annual average of 876 blackbirds and 102,255 European starlings for the three-year period. This is an average annual kill for the entire blackbird group of 103,131 for the period. Between FY 1996 and FY 1998, States in the WS Eastern Region reported a total kill of 371,105 blackbirds and 387,982 European starlings for the three-year period. The average annual reported kill was 11,246 blackbirds and 129,327 European starlings (USDA- WS MIS Database). No other sources of major human-caused blackbird and starling mortality are known.

Natural mortality in blackbird populations is between 50% and 65% of the population each year, regardless of human-caused control operations (USDA 1994). As previously discussed regional annual populations of the blackbird group in the eastern U. S. is at least 372 million, of which an estimated 140 million are European starlings (Meanley and Royall 1976 and Johnson and Glahn 1994). Estimated natural mortality of the blackbird group should therefore total between 186 and 241.8 (average 213.9) million birds annually. Average annual kills of blackbirds and European starlings in Kentucky (103,131) has been less than 0.05% of the estimated average natural mortality of these populations, and would be expected to be no more than 3% of total average mortality in any single year under the current program. The average annual number of blackbirds and European starlings killed in the Kentucky WS BDM program (103,131) amounts to only 0.03% of the southeastern U.S. wintering population (350 million). Regionally, WS's reported kill averages 253,029 blackbirds and European starlings annually, which accounts for only 0.01% of the natural annual mortality and only 0.001% of the regional wintering population.

Dolbeer et al. (1995) showed that WS kills of 3.6% of the wintering population had no effect on breeding populations the following spring. Dolbeer et al. (1976) constructed a population model which indicated that a reduction of 14.8% of the wintering blackbird population would reduce the spring breeding population by 20% and that a 56.2% reduction in the wintering blackbird population would reduce spring breeding populations by only 33%. Given the density-dependent relationships in a blackbird population (i.e., decreased mortality and increased fecundity of surviving birds), a much higher number would likely have to be killed in order to impact the regional breeding population.

Cumulative effects would be mortality caused by the Kentucky WS program added to the other known human causes of mortality. Given that the maximum annual mortality (Table 5-1, FY 1997) of 215,263 blackbirds and European starlings caused by the Kentucky WS program has not accounted for more than .006% of the regional blackbird/European starling population of 372.5 million (Meanley and Royall 1976), and should not exceed 3% of the population in any future year, the proposed damage management projects implemented under this alternative would have no significant impact on overall breeding populations.

Because nonnative European starlings exhibit negative effects on, and competition with, native birds (Ehrlich et al., 1988), they are considered by many wildlife biologists and ornithologists to be an undesirable component of North American wild and native ecosystems. Any reduction in starling populations in North America, even to the extent of complete eradication, could be considered a beneficial impact to native bird species.

American Crow Population Effects

American crows have a wide range and are extremely abundant, being found in most of the United States (National Audubon Society, 2000). They are found in both urban and rural environments and in Kentucky sometimes form large communal roosts in cities. Roosts of more than 5,000 birds have been documented by WS (J. Floyd, R. Myers, B. Hyle, WS Pers. Comm. 1998) in at least two Kentucky counties. In the U. S., some crow roosts may reach a half-million birds (National Audubon Society, 2000). This species

is exempted from protection by the MBTA under conditions in which certain birds, including crows, are identified as "committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance (50 CFR Ch.1[10-1-98 Edition] §21.43), and by hunting regulation in Kentucky through 301 KAR 2:260E which establishes regulations for a hunting season to take crows and allows take of this species under the same conditions of depredation as outlined in 50CFR.

BBS Data (Sauer et al. 1999) indicate that American crow populations increased in the U.S., the eastern BBS region, and Kentucky from 1966-99. WS killed an average of 2,423 American crows per year in Kentucky during FY 1997-99. During this period, BBS data indicates that crow populations trends continued to rise in the State.

Feral Domestic Pigeon Population Effects

The feral domestic pigeon, also known as the rock dove, is an introduced nonnative species in North America. BBS data indicate the species has been stable across the United States from 1967 through 1999, rising slightly in the Eastern BBS region, and decreasing in Kentucky (Sauer et al. 1999). The species is not protected by Federal or State law. Any BDM involving lethal control actions by WS for this species would be restricted to isolated, individual sites, or communities. In those cases where feral domestic pigeons are causing damage or are a nuisance, complete removal of the local population could be achieved. This would be considered to be a beneficial impact on the human environment since it would be requested by the affected property owner or administrator. Although regional population effects would be minor, even if large regional or nationwide reductions could be achieved, this would not be considered an adverse impact on the human environment because the species is not part of native ecosystems. In addition, local reductions or elimination of pigeon flocks would be considered a positive impact to those individuals who are offended by the presence of these birds, and whose enjoyment of native songbirds is diminished by their presence. However, major population reduction in some localities may be considered to have negative effects by some individuals who experience aesthetic enjoyment of pigeons.

Between FY 1997 and FY 1999, WS took an average of 5,583 pigeons per year statewide, primarily to reduce sanitation problems and human health and safety threats associated with accumulations of droppings in areas used by humans. This relatively small number of pigeons taken at multiple sites undoubtedly had little effect on overall pigeon populations in Kentucky.

Waterfowl Population Effects

WS does not usually conduct operational killing of waterfowl, although a few Canada geese and ducks are killed each year at airports as part of wildlife hazard management programs for these facilities. Almost all geese taken under these conditions are resident birds. BDM by WS for these species at other sites has historically been almost entirely nonlethal, and, therefore, results in no direct impact on populations of these species. Sport hunters kill controlled numbers of these species under the close regulatory management of the USFWS and the KDFWR. In Kentucky during FY 1997 - 99, WS

took an average of 33 Canada geese and 46 wild ducks per year, of which 98% were mallards (Table 5-1). WS could kill as many as 100 Canada geese and 300 ducks per year in damage management projects associated with human health and safety in the State in future programs. However, based on current populations and trends, reduction in numbers through such programs would not be expected to have any negative effects on populations of these species in the State, or regionally. BBS population trend data indicates that U. S. and eastern BBS regions saw an increase in both Canada goose and mallard populations. In fact, eastern population trends increased 21.6% as compared with a national increase of 13.1% for Canada geese while mallard populations trends in Kentucky experienced an increase of 13.2% as compared with a national increase of 3.7% and an eastern BBS regional increase of 4.2%.

Harassment by WS employees may negatively affect geese or ducks in the short term, especially if weather is particularly cold, because the birds are expending energy that they would otherwise not have to. However, there are likely no long term significant negative effects due to harassment (John Taylor, USFWS, Pers. Comm. 1997). Birds are usually moved to State or Federal refuges or management areas where higher quality and a larger quantity of feed is available. Some birds may be temporarily negatively affected by the use of alpha chloralose if it is used in live-capture events. However, no significant negative effects are known to occur to individual birds or populations of waterfowl from the use of this stupefactant as a capture mechanism. Also, populations of Canada geese in Kentucky are increasing (R. Pritchert, KDFWR, Pers. Comm., 2000). Increasing populations of both mallards and Canada geese in Kentucky and in the east supports a conclusion that the WS BDM activities have not resulted in any significant direct or indirect adverse effects on these species.

A likely benefit to these species is that the success of the overall program would probably increase the tolerance of agricultural producers and the urban public to the presence of ducks and geese in both rural and urban environments.

American Coot Population Effects

American coots or "mud hens," are common, duck-sized, blackish-gray birds with a white bill, belonging to the Family Gaviidae. They are distributed over most of the lower 48 States and in Canada (Sauer et al. 1999). Coots migrate to Kentucky, or through Kentucky to more southern destinations, in the fall. They are omnivorous, with aquatic and terrestrial plants and invertebrates making up most of their diet.

WS in Kentucky has not conducted any activities aimed at addressing damage caused by American coots. No coots were taken by WS in the State during FY 1997 - 99. However, since coots have been implicated in damage associated with property and human health and safety in the southeast (K. Garner WS, Pers. Comm. 1999) WS may be requested to address such damage in Kentucky. BBS data indicate the coot population has decreased across the eastern United States but has increased in the U.S. as a whole from 1966 through 1999 (Sauer et al. 1999). Since no activities by WS to address coot damage in Kentucky have been performed for the past three fiscal years, minimal damage management activity related to this species is expected. No significant effects on the American coot are expected to occur as a result of WS BDM activities.

English Sparrow Population Effects

English sparrows, or house sparrows, were introduced to North America from England in 1850 and have spread throughout the continent (Fitzwater 1994). The species is not protected by Federal or State laws. Like European starlings and pigeons, because of their negative effects and competition with native bird species, English sparrows are considered by many wildlife biologists, ornithologists, and naturalists to be an undesirable component of North American native ecosystems. English sparrows are found in nearly every habitat except dense forest, alpine, and desert environments. They prefer human-altered habitats, and are abundant on farms and in cities and suburbs (Robbins et al. 1983).

BBS population trends from 1966-99 indicate that English sparrows are decreasing throughout the U. S. as a whole by about 2.4% per year (Sauer et al. 1999). Bird counts in Kentucky during successive years from 1966-96 indicate that English sparrow populations are somewhat higher in the State than the national average and though declines parallel national trends, Kentucky only saw a decline of 2.3% per year over the same period. Robbins (1973) suggested that declines in the population of this species must be largely attributed to changes in farming practices which resulted in cleaner operations. One aspect of changing farming practices which might have been a factor would be the considerable decline in small farms and associated disappearance of a multitude of small feed lots, stables and barns, a primary source of food for these birds in the early part of the 20th century. Ehrlich et al. (1986) suggested that English sparrow population declines might be linked to the dramatic decrease during the 20th century in the presence of horses as transport animals. Grain rich horse droppings were apparently a major food source for this species.

Although precise population numbers for English sparrows were not available for Kentucky and the region, Breeding Bird Surveys and the Audubon Society's, Christmas bird count (Saur et. al. 1996) revealed that this species was relatively, very abundant. Fourteen bird count locations in Kentucky, Tennessee, Illinois, Missouri, Indiana, Ohio, West Virginia and Virginia were randomly sampled by WS from the interactive Christmas Bird Count internet web site by point and click method to evaluate relative bird abundance for the region. Results from sites sampled revealed that for those areas sampled, English sparrows were among the eleven most abundant species. An average of only 5.4% (maximum = 15%, minimum = .8%) of species sampled had higher relative abundances than the English sparrow. Of these birds which had higher abundances than the English sparrow, 50% are commonly identified as problem species by urban governments and WS in Kentucky. Among these were red-winged blackbirds, European starlings, American robins, American crows, common grackles, and Canada geese. Based on relative abundance of English sparrows for this region, application of all non-lethal methods proposed for BDM in Kentucky would not be likely to have any significant impact on regional populations of this species. In the three-year period from FY 1997-99, WS killed an average of only 207 English sparrows per year (Table 5-1) which should be an exceedingly minor component of overall English sparrow populations and overall English sparrow mortality. Because they are considered

extremely abundant and are not afforded protection by Federal or State law, depredation permits are not required before they can be killed by the public.

Any BDM involving lethal control of English sparrows by WS would probably be restricted to individual sites. As stated previously, because English sparrows are not native to North America, any reduction in English sparrow populations, even to the extent of complete eradication, could be considered a beneficial impact on populations of native bird species. Therefore, any reduction in this species' populations in North America should not be considered as having any significant adverse impact on the quality of the human environment. Some individuals who watch or feed English sparrows, or those who might have established human-affectionate bonds with individual birds would be offended by reductions in populations or removal of individual birds.

Black-crowned Night Heron Population Effects

Black-crowned night-herons are considered to be residents in Kentucky (Klingel 1997). In areas of the United States where this species is resident, they are considered to be rare to fairly common. Black-crowned night herons are listed as threatened on the Kentucky Threatened and Endangered Species List, an unofficial State record kept by KDFWR (T. Slone KDFWR, Pers. Comm. 1998). Observations by WS for known birds in Jefferson County, Kentucky indicate that populations fluctuate in the State by seasons. Some birds in the Jefferson County population overwinter in the State while the majority of the summer breeding population migrates, departing in early fall. The diet of the night-heron consists of fish, crustaceans, aquatic insects, frogs, and small mammals (King and Pyle 1966) and the species is normally a nocturnal hunter (Bent 1963), although hunting during all hours of daylight by this species has been observed in Kentucky (R. Myers, Pers. Comm. 2000).

As indicated elsewhere, WS has taken only three black-crowned night herons since beginning damage management activities related to this species in 1994. These birds were accidentally taken as discussed in Subsection 4.2.2.3. BBS population trend data for the period from 1966 to 1999 indicate that black-crowned night herons are decreasing in the Eastern BBS region, but are increasing in the U.S. (Sauer et al. 1999). BBS data also show an increasing population trend of 2.2% per year from 1959 to 1988 in North America. Therefore, the species appears to be doing well and human-caused mortality, including minor numbers taken by WS, has not had any significant adverse impact on populations. During FY 1999 WS received requests to assist a few residents in Louisville regarding property damage and sanitation problems related to nesting black-crowned night herons. Nesting birds were causing concerns about human health as a result of very objectionable droppings deposits and rotting fish carcasses accumulating on lawns beneath rookeries. Large quantities of droppings were also killing grass and trees. WS conducted discussions with the Kentucky Nature Preserves Commission (B. Palmer-Ball Kentucky Nature Preserves Commission Pers. Comm., 1999) regarding nest manipulation activities at these sites. The Commission and WS agreed that if rookeries had hatchlings in the nest, it would be prudent to avoid disturbing the sites. As a result of these discussions WS advised some residents where chicks were already present in nests to suffer damage for the remainder of the season and

contact WS very early the following nesting season so that measures could be implemented to prevent nesting at the sites again. Citizens who were asked to do this were very cooperative, though some lodged formal complaints, and more than 20 black-crowned night heron nests were undisturbed.

Some residents of Jefferson County, Kentucky have also sought assistance in dealing with black-crowned night herons feeding on hobby fish which are usually kept in small landscaped pools in urban yards (R. Myers WS, Pers. Comm., 2000). In the past technical assistance advice has been provided on methods for scaring away herons and for habitat manipulation or exclusionary strategies to deny birds access to valuable fish.

WS may be requested to conduct damage management activities related to black-crowned night herons in the future. WS will coordinate with USFWS and KDFWR before intentionally killing individuals of this species to assure that they have ample opportunity to identify any concerns about the potential for adverse effects on the species. No significant effects related to this species are expected to occur as a result of damage management activities conducted by WS in Kentucky.

Mourning Dove Population Effects

Mourning doves are migratory game birds with substantial populations throughout much of North America. Many States in the U. S. have regulated annual hunting seasons for the species and take is liberal. Kentucky allows a hunting season each year with generous bag limits of this species. BBS data indicates that mourning dove population trends were decreasing slightly (-.4%) in the U.S., but rising (.4%) in the Eastern BBS Region, and Kentucky (.3%) from 1967-99 (Saur et al., 1999). Mourning doves have become common inhabitants of urban environments in Kentucky, even nesting frequently in man-made structures (D. Bentfield, R. Myers, K. Stucker, WS Pers. Comm, 1999). This species is the most abundant dove in North America, is the champion of multiple brooding in its range, and is expanding northward (Ehrlich et al, 1988). In Kentucky, WS killed an average of 606 mourning doves per year during FY 1997-99. Most of these birds were taken in programs to protect human safety at airports. Based on population trends for this species in Kentucky, WS BDM activities will not have a significant impact on the species.

Killdeer Population Effects

Killdeers are the largest of North American plovers, are migratory, and are commonly seen in open terrain such as plowed fields, golf courses, and short grass prairies (Nat. Audubon Soc., 2000) This species has become a common inhabitant of airports in the U. S. also (USDA-Wildlife Services, Unpublished Data). At such facilities, they frequent fringe areas of runways and taxiways, often spending extended time on paved areas. Such behavior causes birds to present considerable hazards to arriving and departing aircraft. Small flocks of killdeers, numbering less than 25 birds, are frequently found in runway and taxiway areas, respond poorly to various harassment techniques and will frequently return to an area quickly, or simply move to another portion of pavement

nearby. Such behavior often necessitates harassment / shooting of a few birds in the flock to disperse remaining birds (D. T. Little and K. Stucker WS, Pers. Comm. 1999).

During FY 1997-99 WS killed an average of 169 killdeer per year. Of these, 70% were killed during harassment / shooting events in order to disperse 1518 individuals of this species which were not killed (USDA - WS MIS Database).

BBS data indicates that killdeer population trends increased by .3% across the U. S., by .6% in the eastern BBS region, and by 1.6% in Kentucky between 1966-99 (Sauer et al., 1999). This suggests that no negative effects have resulted from any BDM activities by WS in Kentucky related to this species. Average numbers of these birds taken by WS programs in Kentucky may increase with increasing population levels or if WS conducts additional wildlife hazard management activities on airports which exhibit concentrations of these birds. However, no negative effects are expected to occur as a result of any BDM programs addressing damage by this species in Kentucky.

Red-tailed Hawk Population Effects

Red-tailed hawks are North America's most common and widespread buteo. They are occasionally abundant and occur in every North American habitat except high Arctic and extensive tracts of dense forest. Northern birds are migratory. They are birds of both open and wooded areas, particularly wood edges, and are often seen perched conspicuously on a treetop, a telephone pole, or other lookout while hunting (Clark and Wheeler, 1987). BBS trend data for red-tailed hawks reveals that populations have increased across the U. S. (3.1%), the eastern BBS region (4.3%), and Kentucky (2.9%) from 1966-98 (Sauer et al., 1999).

Red-tailed hawks are frequently found hunting at airports. They spend considerable time soaring over runways and taxiways and are sometimes involved in air strikes with aircraft. Raptors (hawks and owls) are involved in 11% of air strikes involving birds in the United States (USDOT, 1998) and red-tailed hawks are one of two most frequently observed hawks at airports in Kentucky (K. Stucker and D. T. Little, WS, Pers. Comm. 1999). Based on more than 400 damage management events conducted by WS and related to hawks at Kentucky airports during FY 1997-99, approximately 72% were conducted because of the presence of red-tailed hawks (USDA-WS MIS Database). Sometimes WS kills red-tailed hawks as part of programs to protect air passengers and aircraft. During FY 1997-99 WS killed 82 red-tailed hawks in all BDM programs. More than 98% of these birds were killed on airports. During this same period 539 red-tailed hawks were addressed through various methods applications including live-capture and translocation, and noise harassment.

Population increases for red-tailed hawks were slightly lower for Kentucky than for the entire U. S. and also for the eastern BBS region as indicated previously. However, examination of BBS population trends for several states in the southeast and adjacent states to the north of Kentucky revealed that population trends between 1966-98 were comparable or lower than Kentucky for southeastern states but markedly higher for some northern adjacent states (Table 5-2). However, comparisons of population trends for red-tailed hawks (using BBS trend estimation values) for the period of 1996-98 revealed that Kentucky showed a marked population increase during the period, comparable to

Alabama, Ohio, Indiana and Illinois, while other sampled southeastern States actually showed negative population trends (Table 5-2). This occurred during a portion of the fiscal years in which WS conducted lethal removal of hawks previously discussed. The data suggests that BDM activities by WS in Kentucky have had no negative effects on red-tailed hawk populations. Future BDM projects in Kentucky by WS will be similar in scope to past activities and no significant effects on red-tailed hawk populations are expected as a result.

In order to rule out possible effects from other WS programs in States sampled from the BBS database, examination of the WS National MIS Database to determine whether other State WS programs in those States killed red-tailed hawks was conducted. Results revealed that only two States had programs in which hawks were killed during FY 1995-98, the time period corresponding to the sampled BBS data. Those States with numbers of hawks killed are provided in Table 5-2. Numbers of red-tailed hawks killed in those States were insignificant relative to population trends and probably had no effects on local, state, or regional populations.

Table 5-2. Population Trends for Red-tailed Hawks During Two Time Intervals by Selected States in The Southeastern U. S. And Some Northern States Bordering Kentucky, And Numbers of This Species Killed in WS Programs by State From October 1994 - September 1998.

STATES	Population Trend for:	Population Trend for:	Red-tailed Hawks Killed for Period:
	1966 - 1998	1996 - 1998	10-94 Through 9-98
MISSISSIPPI	23.29	- 8.44	0
ALABAMA	4.24	19.36	0
GEORGIA	3.29	- 13.60	0
KENTUCKY	3.84	28.54	90
TENNESSEE	1.15	- 33.59	2
NORTH CAROLINA	2.85	- 0.37	0
OHIO	2.80	16.52	0
INDIANA	5.56	43.53	0
ILLINOIS	11.40	12.69	1

American Kestrel Population Effects

The widespread American Kestrel is the smallest North American falcon and one of the most common raptors. This species is often seen hovering or sitting on exposed perches, such as poles, wires, or treetops, where it hunts for rodents, insect, birds, lizards, or snakes. They are

widespread and common throughout North America south of the arctic treeline in most habitats and prefer more open country. Northern populations are migratory, with some birds moving as far south as Central America. They are abundant in the southern U. S. in winter (Clark and Wheeler, 1987). Their habit of hunting open places makes airport especially attractive. These hawks are the second most frequently encountered raptor at airports in Kentucky (K. Stucker and D. T. Little, WS Pers. Comm., 1999). Their habit of hovering over a hunting site makes them particularly vulnerable to aircraft traffic. On airports in Kentucky, they favor grassed areas alongside runways and taxiways and can be observed hovering directly in approach paths of arriving or departing aircraft (R. Myers WS, Pers. Comm. 2000). During FY 1997-99, 14 American kestrels were involved in wildlife strikes at two airports in Kentucky where WS conducts wildlife hazard management programs. During the same period, WS killed an average of 43 kestrels per year in BDM programs at airports. Comparable numbers of this species could be killed in future programs by WS in Kentucky.

BBS data indicates that American kestrel population trends increased in the U. S. (0.1%), in the eastern BBS region (0.3%) and in Kentucky (0.4%) from 1966-1998. The trend was higher for Kentucky than nationally or in the eastern BBS region. This data suggests that no significant negative effects have occurred to this species from any BDM activities by WS in Kentucky. No negative effects are expected to occur as a result of future BDM programs by WS in Kentucky.

BBS data indicates that American kestrel population trends increased in the U. S. (0.1%), in the eastern BBS region (0.3%) and in Kentucky (0.4%) from 1966-1998. The trend was higher for Kentucky than nationally or in the eastern BBS region. This data suggests that no significant negative effects have occurred to this species from any BDM activities by WS in Kentucky. No negative effects are expected to occur as a result of future BDM programs by WS in Kentucky.

Vulture Population Effects

The turkey vulture is one of three species of vultures found in North America and is the most common and widespread of the New World vultures. This species nests throughout all of the United States except northern New England. They are conspicuous for their soaring behavior as they search for carcasses, locating them primarily by aid of the sense of smell. They possess weak feet and blunt claws instead of sharp talons like hawks and owls. Their heads are bare, which assists them in preventing their feathers from becoming fouled by carrion. They nest in tree cavities or on the ground. Turkey vultures are valuable for their removal of garbage and disease-causing carrion. At night they often gather in large roosts (National Audubon Society, 2000).

BBS population trend data indicates that the turkey vulture has experienced an increasing population trend in the U. S. as a whole (3.1%), in the eastern BBS region (1.1%) and in Kentucky (0.7%) from 1966-98 (Sauer et al., 1999). Although the population trend is lower for Kentucky during this period, BBS data shows that from 1996 - 1998 the population trend for turkey vultures increased by 42.42% in the

State. The average population trend estimate for the nine States adjacent to Kentucky, sampled for red-tailed hawk population trends provided in Table 5-2 for the same period, was 19.12%, and the average of all 10 States sampled, which included Kentucky, was 21.45%. Kentucky's turkey vulture population trend has apparently been higher during the past three years than the average for States in the surrounding area.

Black vultures are scavengers that feed on carrion, but they also take weak, sick, or unprotected young birds and mammals. They are smaller but more aggressive than turkey vultures and will drive the latter from a carcass. Both species are often found perched in trees, on fence posts, and on the ground, or flying high overhead, especially on windy days, taking advantage of thermals or updrafts. Unlike turkey vultures, black vultures depend on their vision to find food. This species is more or less resident from Texas and Arkansas north and east to New Jersey and south to Florida, and are rarely found as far north and east as Massachusetts and Maine (National Audubon Society, 2000).

BBS data reveals an increasing population trend for black vultures in the U. S. (2.6%), the eastern BBS region (2.2%) and Kentucky (10.8%) from 1966 through 1998 (Sauer et al., 1999). This species appears to exhibit healthy and burgeoning populations in most of its range and has been reported to cause damage in several locations in the southeast (B. Constantin WS, K. Garner WS, 1999, K. Stucker, WS, 2000, Pers. Comm.).

WS receives requests to address damage caused by both turkey and black vultures in Kentucky. Sometimes these two species are found causing damage at the same site and congregating in mixed flocks. During FY 1997-99 WS killed 82 vultures in all BDM activities. Most of these birds were killed in association with harassment shooting to reinforce noise harassment as part of vulture dispersal activities. This small number of birds apparently had no significant impact on populations of the species in Kentucky or the region. Similar programs will likely be conducted in the future in the State. It is possible that WS could kill as many as 200 vultures each year in such programs. No significant negative effects are expected to occur as a result of such BDM programs.

Fish-eating Bird Population Effects

Fish-eating birds and damage associated with them was discussed in Subsection 1.3.8. Birds listed in that discussion may be addressed in BDM projects related to abatement of damage to aquaculture or other fish producing operations. Damage by them may also be addressed on a very small scale by WS in technical or direct assistance programs dealing with recreational fish production, such as a few exotic fish in a backyard pool.

Great-blue herons, double-crested cormorants, and little blue herons are the only fish-eating birds reported to WS in Kentucky as causing damage to fish production facilities. They have also been implicated in damages to recreational fish collections

in urban environments, as has the black-crowned night heron (USDA-WS MIS Database). All named species except the black-crowned night heron exhibited increasing population trends in the Kentucky from 1966-98 (Sauer et al., 1999). Damage management associated with black-crowned night herons was discussed previously in this subsection.

BBS data revealed a negative population trend (- 3.4) for little blue herons from 1966-98 in the eastern BBS region, suggesting a decline in this species in that zone. However, examination of population trends for these birds from 1996-98 shows an increasing trend of 9.46% (Sauer et al., 1999) suggesting that the bird has been flourishing for the past few years.

Double-crested cormorant populations are at an all time high of more than an estimated 1-2 million birds, and these birds have been identified throughout much of the U. S. as causing excessive damage to aquaculture facilities by feeding on fish being produced (USDI 1998). Severe damage has been documented in Kentucky and is discussed in Subsection 1.3.8. USFWS has issued a standing depredation order authorizing that "in States where this species is shown to be seriously injurious to commercial freshwater aquaculture, and when found committing or about to commit depredations upon aquaculture stocks, persons engaged in the production of commercial freshwater aquaculture stocks may, without a Federal permit, take or cause to be taken such double -crested cormorants as might be necessary to protect aquaculture stocks" (USDI 1998).

WS may be requested to assist in managing damage caused by fish-eating birds in Kentucky. Normally, such BDM programs would employ noise harassment with harassment shooting with live shotgun rounds to reinforce other methods of dispersal. In such situations, 10-20% of offending birds may be killed to successfully protect the resources of a project site. Approximately 50-100 little blue herons and 100-150 great blue herons could be killed annually by WS in such programs throughout Kentucky. In BDM projects involving double-crested cormorants, 400-500 birds of this species could be killed annually in all Kentucky programs. Based on present population trends for these three species, no significant negative effects are expected as a result of WS activities to manage damage being caused by them.

Other Target Species

Target species in addition to those analyzed above that have been killed in small numbers by WS during the past three fiscal years include eastern meadow larks (n=57), feral domestic ducks (n=31) and feral geese (n=127) (Table 5-1). Other species that could be killed during BDM include any of the species listed in Section 1.2. None of these species are expected to be taken by WS BDM at any level that would significantly affect populations.

5.1.1.2 Alternative 2 - Nonlethal BDM Only by WS

Under this alternative, WS would not take any target species because no lethal

methods would be used. This alternative would have the same impact on black-crowned night heron populations as the current program since WS's damage management for this species is already nonlethal only. Likewise, impacts to waterfowl would remain essentially unchanged, except for feral domestic ducks and geese which are sometimes euthanized. Some incidental take of waterfowl would occur as a result of the use of alpha-chloralose, as in the present program. Although WS take of other target bird species such as English sparrows, feral domestic pigeons, blackbirds, and European starlings would not occur, it is likely that, without WS conducting some level of lethal BDM activities for these species, private BDM efforts would increase, leading to potentially similar or even greater effects on target species populations than those of the current program alternative. For the same reasons shown in the population effects analysis in section 4.1.1.1, however, it is unlikely that European starlings or other target bird populations would be impacted significantly by implementation of this alternative. Effects and hypothetical risks of illegal chemical toxicant use under this alternative would probably be greater than the proposed action, about the same as Alternative 3, but less than under Alternative 4.

5.1.1.3 Alternative 3 - Technical Assistance Only

Under this alternative, WS would have no direct impact on English sparrow, feral domestic pigeons, blackbird, European starling, or other target species populations in the State because the program would not conduct any operational BDM activities but would be limited to providing advice only. Private efforts to reduce or prevent bird damage and perceived disease transmission risks could increase which could result in similar or even greater effects on those populations than the current program alternative. For the same reasons shown in the population effects analysis in section 4.1.1.1, however, it is unlikely that European starlings or other target bird populations would be impacted significantly by implementation of this alternative. DRC-1339 and the tranquilizer alpha-chloralose are currently only available for use by WS employees. It is hypothetically possible that frustration caused by the inability to reduce damage and associated losses could lead to illegal use of other chemicals which could lead to real but unknown effects on target bird populations. Effects and hypothetical risks of illegal chemical toxicant use under this alternative would probably be about the same as those under Alternative 2.

5.1.1.4 Alternative 4 - No Federal WS BDM

Under this alternative, WS would have no impact on English sparrow, feral domestic pigeon, blackbird, starling, or other target species populations in the State. Private efforts to reduce or prevent depredations could increase which could result in effects on target species populations to an unknown degree. Effects on target species under this alternative could be the same, less, or more than those of the proposed action depending on the level of effort expended by private persons. For the same reasons shown in the population effects analysis in section 4.1.1.1 it is unlikely that European starlings or other target bird populations would be impacted significantly by implementation of this alternative. DRC-1339 and the tranquilizer alpha-chloralose are currently only available

for use by WS employees. It is hypothetically possible that frustration caused by the inability to reduce damage and associated losses could lead to illegal use of other chemicals which could lead to real but unknown effects on target bird populations.

5.1.2 Effects on Nontarget Species Populations, Including Threatened and Endangered Species

5.1.2.1 Alternative 1 - Continue the Current Federal Bird Damage Management Program (The Proposed Action)

Adverse Effects on Nontarget (non-T&E) Species. WS take of nontarget species during BDM activities has been extremely low. The only nontarget birds known to have been killed during BDM operations as described in the proposed action from FY 1997-99 were twenty European starlings (Table 5-1). These data indicate that nontarget mortality has only been .00006% of the total number of birds killed over the past three years. Although it is possible that some nontarget birds were unknowingly killed by use of DRC-1339 for pigeon or blackbird/starling control, the method of application is designed to minimize or eliminate that risk. For example, DRC-1339 treated bait is only applied after a period of prebaiting with untreated bait material and when nontarget birds are not observed coming to feed at the site.

While every precaution is taken to safeguard against taking nontarget birds, at times changes in local flight patterns and other unanticipated events can result in the incidental take of unintended species. These occurrences are rare and should not affect the overall populations of any species under the current program.

Beneficial Effects on Nontarget Species. Interspecific nest competition has been well documented in European starlings. Miller (1975) and Barnes (1991) reported European starlings were responsible for a severe depletion of the eastern bluebird (*Sialis sialis*) population due to nest competition. Nest competition by European starlings has also been known to adversely impact American kestrels (sparrow hawks) (Von Jarchow 1943, Nickell 1967, and Wilmer 1987), red-bellied woodpeckers (*Centurus carolinus*), Gila woodpeckers (*Centurus uropygialis*) (Kerpez et.al. 1990 and Ingold 1994), and wood ducks (*Aix sponsa*) (Shake 1967, McGilvery et.al 1971, Heusmann et.al. 1977, and Grabill 1977). Weitzel (1988) reported nine native species of birds in Nevada had been displaced by starling nest competition, and Mason et al. (1972) reported European starlings evicting bats from nest holes. Control operations as proposed in this alternative could reduce starling populations, although probably not significantly. Reduction in nest site competition would be a beneficial impact on the species listed above. Although such reductions are not likely to be significant, the benefits would probably outweigh any adverse effects due to nontarget take.

WS BDM in Kentucky would have no effect on any of the above listed mammals, fish, reptiles, mussels, crustaceans, insects, or plants.

T&E Species Effects. T&E species that are Federally listed (or proposed for listing) for the State of Kentucky are:

Mammals:

Virginia big-eared bat (*Corynorhinus townsendii virginianus*)
Gray bat (*Myotis grisescens*)
Indiana bat (*Myotis sodalis*)

Birds:

Bald eagle (*Haliaeetus leucocephalus*)
Red cockaded woodpecker (*Picoides borealis*)
Interior least tern (*Sterna antillarum athalassos*)

Reptiles:

Copperbelly water snake (*Nerodia erythrogaster neglecta*)

Fish:

Relict darter (*Etheostoma chienense*)
Duskytail darter (*Etheostoma percnurum*)
Palestripe shiner (*Notropis albizonatus*)
Blackside dace (*Phoxinus cumberlandensis*)
Pallid sturgeon (*Scaphirhynchus albus*)

Mussels:

Cumberland elktoe (*Alasmidonta atropurpurea*)
Fanshell (*Cyprogenia stegaria*)
Cumberlandian combshell (*Epioblasma brevidens*)
Oyster mussel (*Epioblasma capsaeformis*)
Catspaw (*Epioblasma obliquata obliquata*)

Mussels, cont'd

Northern riffleshell (*Epioblasma torulosa rangiana*)
Pink mucket (*Lampsilis abrupta*)
Ring pink (*Obovaria retusa*)
Little-wing pearlymussel (*Pegias fabula*)
Orange-foot pimpleback (*Plethobasus cooperianus*)
Clubshell (*Pleurobema clava*)
Rough pigtoe (*Pleurobema plenum*)
Fat pocketbook (*Potamilus capax*)
Cumberland bean (*Villosa trabalis*)

Crustaceans:

Kentucky cave shrimp (*Palaemonias ganteri*)

Insects:

American burying beetle (*Nicrophorus americanus*)

Plants:

Price's potato-bean (*Apios priceana*)
Braun's rock cress (*Arabis perstellata* var. *perstellata*)
Cumberland rosemary (*Conradina verticillata*)
Eggert's sunflower (*Helianthus eggertii*)
Cumberland sandwort (*Minuartia cumberlandensis*)
White-haired goldenrod (*Solidago albopilosa*)
Short's goldenrod (*Solidago shortii*)
Virginia spiraea (*Spiraea virginiana*)
Running buffalo clover (*Trifolium stoloniferum*)

The 1992 Biological Opinion from the USFWS determined that the only BDM method that might adversely affect the bald eagle was above ground use of strychnine treated bait for "nuisance birds." Strychnine is no longer registered for above ground use and would not be used by WS for BDM in the State. DRC-1339 poses no primary hazard to eagles because eagles do not eat grain or other bait materials on which this chemical might be applied during BDM, and, further, because eagles are highly resistant to DRC-1339 — up to 100 mg doses were force fed to captive golden eagles with no mortality or adverse effects noted other than regurgitation and head-shaking (Larsen and Dietrich 1970). Secondary hazards to raptors from DRC-1339 and Avitrol are low to nonexistent (see Appendix B). Therefore, WS BDM in Kentucky is not likely to have adverse effects on bald eagles.

The red-cockaded woodpecker was granted endangered status in 1970 (USFWS 2000). Kentucky lies in the extreme northern portion of its range. The 1992 Biological Opinion from the USFWS made no determination concerning any effect by WS BDM programs on the red-cockaded woodpecker and no effects from any component of a WS BDM program were identified in the programmatic ADC FEIS (USDA 1994). There are approximately 22 red-cockaded woodpeckers presently in Kentucky, and are found in the southeastern part of the State (L. Penrey, U.S. Forest Serv., Pers. Comm. 2000). This species uses mature pine and mixed pine and hardwood timber for habitat, feeding chiefly on insects. Because of feeding habits, diet, and habitat of this species, no negative effects are expected to occur in Kentucky related to any BDM activity conducted by WS. DRC-1339 nor Avitrol pose any primary hazard to red-cockaded woodpeckers because they do not eat grain or other bait materials on which this chemical might be applied during BDM programs. In addition, no secondary effects on red-cockaded woodpeckers are expected related to any actions in the Kentucky WS BDM program.

The interior least tern was granted endangered status in 1985 and has been estimated at 4,700-5,000 adults. This species breeds along the major tributaries of the Mississippi River drainage basin from eastern Montana south to Texas and east to western Illinois, Missouri, Arkansas and Louisiana. Characteristic riverine nesting sites are dry, flat, sparsely vegetated sand and gravel bars within a wide, unobstructed, water-filled river channel. They feed on small fish captured in the shallow water of rivers and lakes, choosing almost any fish species between one-half to three inches in length (Nebraska Game And Parks Commiss. 2000). The ADC FEIS concluded that control of least tern nest predators such as American crows, American kestrels, and great-horned owls (Nebraska Game And Parks Commiss. 2000) could have a positive effect on populations of this species. Because DRC-1339 and Avitrol are not applied in or near water and least terns feed in water and do not feed on grains or other bait materials used, no primary effects from chemical methods in the Kentucky WS BDM program are expected. No effects on this species from other actions of the BDM program conducted by WS in Kentucky are expected. No secondary effects on least terns, from any activity of the Kentucky BDM program, are expected.

Mitigation measures to avoid T&E effects were described in Chapter 3 (Subsection 3.4.2.2) and are also described in Subsection 4.1.4.1 of this chapter. The inherent safety features of DRC-1339 use that preclude or minimize hazards to mammals and plants are described in Appendix B and in a formal risk assessment in the ADC FEIS (USDA 1994, Appendix P). Those measures and characteristics should assure there would be no jeopardy to T&E species or adverse effects on

mammalian or non-T&E bird scavengers from the proposed action. None of the other control methods described in the proposed action alternative pose any hazard to nontarget or T&E species.

5.1.2.2 Alternative 2 - Nonlethal BDM Only by WS

Under this alternative, WS take of nontarget animals would probably be less than that of the proposed action because no lethal control actions would be taken by WS. However, nontarget take would not differ substantially from the current program because the current program takes very few nontarget animals. On the other hand, people whose bird damage problems were not effectively resolved by nonlethal control methods would likely resort to other means of lethal control such as use of shooting by private persons or even illegal use of chemical toxicants. This could result in less experienced persons implementing control methods and could lead to greater take of nontarget wildlife than the proposed action. For example, shooting by persons not proficient at bird identification could lead to killing of nontarget birds. It is hypothetically possible that frustration caused by the inability to reduce damage and associated losses could lead to illegal use of chemical toxicants which could lead to unknown effects on local nontarget species populations, including T&E species. Hazards to raptors, including bald eagles and falcons, could therefore be greater under this alternative if chemicals that are less selective or that cause secondary poisoning are used by frustrated private individuals.

5.1.2.3 Alternative 3 - Technical Assistance Only

Alternative 3 would not allow any WS direct operational BDM in Kentucky. There would be no impact on nontarget or T&E species by WS activities from this alternative. Technical assistance or self-help information would be provided at the request of producers and others. Although technical support might lead to more selective use of control methods by private parties than that which might occur under Alternative 2, private efforts to reduce or prevent depredations could still result in less experienced persons implementing control methods leading to greater take of nontarget wildlife than under the proposed action. It is hypothetically possible that, similar to but probably less than under Alternative 2, frustration caused by the inability to reduce damage and associated losses could lead to illegal use of chemical toxicants which could lead to unknown effects on local nontarget species populations, including some T&E species. Hazards to raptors, including bald eagles, could therefore be greater under this alternative if chemicals that are less selective or that cause secondary poisoning are used by frustrated private individuals.

5.1.2.4 Alternative 4 - No Federal WS Bird Damage Management

Alternative 4 would not allow any WS BDM in the State. Nontarget take should not differ substantially from the current program because the current program takes very few nontarget animals. However, parties with bird damage problems would likely resort to other means of control such as use of shooting by private persons or even illegal use of chemical toxicants. There would be no impact on nontarget or T&E species by WS BDM activities from this alternative. However, private efforts to reduce or prevent depredations could increase which could result in less experienced persons implementing control methods and could lead to greater take of nontarget wildlife than under the proposed action. It is hypothetically possible that frustration caused by the inability to reduce damage and associated losses could lead to illegal use of chemical toxicants which could impact local nontarget species populations, including some T&E species.

Hazards to raptors, including bald eagles, could therefore be greater under this alternative if chemicals that are less selective or that cause secondary poisoning are used by frustrated private individuals.

5.1.3 Effects on Human Health and Safety

5.1.3.1 Effects of Chemical BDM Methods on Human Health by Alternative

Alternative 1 - Continue the Current Program (Proposed Action)

DRC-1339 DRC-1339 is the primary lethal chemical BDM method that would be used under the current program alternative. There has been some concern expressed by a few members of the public that unknown but significant risks to human health may exist from DRC-1339 used for BDM.

The Kentucky WS program used an average of 2,008.69 grams of DRC-1339 during each of the past three years (range of 1764 to 2270.05 grams per year). This chemical is one of the most extensively researched and evaluated pesticides ever developed. Over 30 years of studies have demonstrated the safety and efficacy of this compound. Appendix B provides more detailed information on this chemical and its use in BDM. Factors that virtually eliminate any risk of public health problems from use of this chemical are:

- its use is prohibited within 50 feet of standing water and cannot be applied directly to food or feed crops (contrary to some misconceptions expressed by a few members of the public, DRC-1339 is not applied to feed materials that livestock can feed upon).
- DRC-1339 is highly unstable and degrades rapidly when exposed to sunlight, heat, or ultraviolet radiation. The half-life is about 25 hours, which means that treated bait material generally is nearly 100% broken down within a week.
- it is more than 90% metabolized in target birds within the first few hours after they consume the bait. Therefore, little material is left in bird carcasses that may be found or retrieved by people.
- application rates are extremely low (less than 0.1 lb. of active ingredient per acre) (EPA 1995).
- a human would need to ingest the internal organs of birds found dead from DRC-1339 to have any chance of receiving even a minute amount of the chemical or its metabolites into his/her system. This is highly unlikely to occur.

- The EPA has concluded that, based on mutagenicity (the tendency to cause gene mutations in cells) studies, this chemical is not a mutagen or a carcinogen (i.e., cancer-causing agent) (EPA 1995). Notwithstanding, the extremely controlled and limited circumstances in which DRC-1339 is used would prevent any exposure of the public to this chemical.

The above analysis indicates that human health risks from DRC-1339 use would be virtually nonexistent under any alternative.

Avitrol (4-Aminopyridine). Avitrol is another chemical method that might be used by WS in BDM. Although this chemical was not identified as being one of concern for human health effects, analysis of the potential for adverse effects is presented here. Appendix B provides more detailed information on this chemical.

Avitrol is available as a prepared grain bait mixture or as a powder. It is formulated in such a way that ratios of treated baits to untreated baits are no greater than 1:9. Use has been extremely limited in the Kentucky WS program — over the 3-year period of FY 1997-99 WS only used a total of 53 grams (1.87 ounces) of technical Avitrol in all baits. This represents an average of 17.7 grams (.63 ounces) per year for the period. These applications killed a total of 102 European starlings, and 305 English sparrows. In addition to this limited use, other factors that virtually eliminate health risks to members of the public from use of this product as an avicide are:

- It is readily broken down or metabolized into removable compounds that are excreted in urine in the target species (ETOXNET 1996). Therefore, little of the chemical remains in killed birds to present a hazard to humans.
- a human would need to ingest the internal organs of birds found dead from Avitrol ingestion to have any chance of receiving even a minute amount of the chemical or its metabolites into his/her system. This is highly unlikely to occur. Furthermore, secondary hazard studies with mammals and birds have shown that there is virtually no hazard of secondary poisoning.
- although Avitrol has not been specifically tested as a cancer-causing agent, the chemical was found not to be mutagenic in bacterial organisms (EPA 1997). Therefore, the best scientific information available indicates it is not a carcinogen. Notwithstanding, the extremely controlled and limited circumstances in which Avitrol is used would prevent exposure of members of the public to this chemical.

The above analysis indicates that human health risks from Avitrol use would be virtually nonexistent under any alternative.

Other BDM Chemicals. Other nonlethal BDM chemicals that might be used or recommended by WS would include repellents such as methyl or di-methyl anthranilate (artificial grape flavoring used in foods and soft drinks sold for human

consumption), which has been used as an area repellent, anthraquinone which is presently marketed as Flight Control, and the tranquilizer drug alpha-chloralose. Such chemicals must undergo rigorous testing and research to prove safety, effectiveness, and low environmental risks before they would be registered by EPA or FDA. Any operational use of chemical repellents would be in accordance with labeling requirements under FIFRA and State pesticide laws and regulations which are established to avoid unreasonable adverse effects on the environment. Following labeling requirements and use restrictions are a built-in mitigation measure that would assure that use of registered chemical products would avoid significant adverse effects on human health.

Based on a thorough Risk Assessment, APHIS concluded that, when WS program chemical methods are used in accordance with label directions, they are highly selective to target individuals or populations, and such use has negligible effects on the environment (USDA 1994).

Alternative 2 - Nonlethal BDM Only by WS

Alternative 2 would not allow for any lethal methods use by WS in the State. WS could only implement nonlethal methods such as harassment and exclusion devices and materials. Nonlethal methods could, however, include the tranquilizer drug alpha-chloralose and chemical repellents such as anthraquinone and methyl anthranilate which, although already considered safe for human consumption because it is artificial grape flavoring, which might nonetheless raise concerns about human health risks. Such chemicals must undergo rigorous testing and research to prove safety, effectiveness, and low environmental risks before they would be registered by EPA or FDA. Any operational use of chemical repellents and tranquilizer drugs would be in accordance with labeling requirements under FIFRA and State pesticide laws and regulations and FDA rules which are established to avoid unreasonable adverse effects on the environment. Following labeling requirements and use restrictions are a built-in mitigation measure that would assure that use of registered chemical products would avoid significant adverse effects on human health.

Excessive cost or ineffectiveness of nonlethal techniques could result in some entities rejecting WS's assistance and resorting to other means of BDM. Such means could include illegal pesticide uses. Evidence of illegal pesticide use was found several years ago in the City of Carlsbad, New Mexico when a dead hawk found near some dead pigeons was determined to have died from strychnine poisoning presumably from feeding on strychnine poisoned pigeons (L. Killgo, DS, USDA, APHIS, WS, Roswell, NM Pers. Comm. 1999).

Alternative 3 - Technical Assistance Only

Alternative 3 would not allow any direct operational BDM assistance by WS in the State. WS would only provide advice and, in some cases, equipment or materials (i.e., by loan or sale) to other persons who would then conduct their own damage management actions. Concerns about human health risks from WS's use of chemical

BDM methods would be alleviated because no such use would occur. DRC-1339 is only registered for use by WS personnel and would not be available for use by private individuals except certified applicators under the direct supervision of WS personnel. Private efforts to reduce or prevent damage would be expected to increase, resulting in less experienced persons implementing damage management methods and leading to a greater risk than the No Action/Proposed Action alternative. However, because some of these private parties would be receiving advice and instruction from WS, concerns about human health risks from chemical BDM methods use should be less than under Alternative 2. Commercial pest control services would be able to use Avitrol and such use would likely occur to a greater extent in the absence of WS's assistance. Use of Avitrol in accordance with label requirements should preclude any hazard to members of the public. Hazards to humans and pets could be greater under this alternative if chemicals that are less selective or that cause secondary poisoning are used. It is hypothetically possible that frustration caused by the inability to alleviate bird damage could lead to illegal use of certain toxicants that, unlike WS's controlled use of DRC-1339 and Avitrol, could pose secondary poisoning hazards to pets and to mammalian and avian scavengers. Some chemicals that could be used illegally would present greater risks of adverse effects on humans than those used under the current program alternative.

Alternative 4 - No Federal WS Bird Damage Management

Alternative 4 would not allow any WS BDM in the State. Concerns about human health risks from WS's use of chemical BDM methods would be alleviated because no such use would occur. DRC-1339 is only registered for use by WS personnel and would not be available for use by private individuals. Private efforts to reduce or prevent damage would be expected to increase, resulting in less experienced persons implementing damage management methods and potentially leading to greater risk to human health and safety than the Current Program alternative. Commercial pest control services would be able to use Avitrol and such use would likely occur to a greater extent in the absence of WS's assistance. Use of Avitrol in accordance with label requirements should preclude any hazard to members of the public. However, hazards to humans and pets could be greater under this alternative if other chemicals that are less selective or that cause secondary poisoning are used. It is hypothetically possible that frustration caused by the inability to alleviate bird damage could lead to illegal use of certain toxicants that, unlike WS's controlled use of DRC-1339 and Avitrol, could pose secondary poisoning hazards to pets and to mammalian and avian scavengers. Some chemicals that could be used illegally would present greater risks of adverse effects on humans than those used under the current program alternative.

5.1.3.2 Effects on Human Safety of Nonchemical BDM Methods by Alternative

Alternative 1 - Continue the Current Program (Proposed Action)

Nonchemical BDM methods that might raise safety concerns include shooting with firearms and harassment with pyrotechnics. Firearms are only used by WS personnel

who are experienced in handling and using them. WS personnel receive safety training on a periodic basis to keep them aware of safety concerns. The Kentucky WS program has had no accidents involving the use of firearms or pyrotechnics in which a member of the public was harmed. A formal risk assessment of WS's operational management methods found that risks to human safety were low (USDA 1994, Appendix P). Therefore, no significant effects on human safety from WS's use of these methods is expected.

Alternative 2 - No Federal WS Bird Damage Management

Under this alternative, WS would not engage in or recommend use of any nonchemical BDM methods. Risks to human safety from WS's use of firearms and pyrotechnics would be lower than the current program alternative, but not significantly because Kentucky WS's current BDM program has an excellent safety record in which no accidents involving the use of these devices have occurred that have resulted in a member of the public being harmed. However, increased use of firearms and pyrotechnics by less experienced or poorly or improperly trained private individuals would probably occur without WS assistance. Risks to human safety would probably increase under this alternative, although not significantly.

Alternative 3 - Technical Assistance Only

Under this alternative, WS would not engage in direct operational use of any nonchemical BDM methods. Risks to human safety from WS's use of firearms and pyrotechnics would be lower than the current program alternative, but not significantly because Kentucky WS's current BDM program has an excellent safety record in which no accidents involving the use of these devices have occurred that have resulted in a member of the public being harmed. Increased use of firearms and pyrotechnics by less experienced and poorly or improperly trained private individuals would probably occur without WS direct operational assistance which would likely increase human safety risks somewhat. Similar to Alternative 2, however, it is unlikely that these increased risks would become significant.

Alternative 4 - No Federal WS Bird Damage Management

Alternative 4 would not allow any WS BDM in the State. Concerns about human health risks from WS's use of nonchemical BDM methods would be alleviated because no such use would occur. The use of firearms or pyrotechnics by WS would not occur in BDM activities in the State. However, private efforts to reduce or prevent damage would be expected to increase, resulting in less experienced persons implementing damage management methods and potentially leading to greater risk to human health and safety than the Current Program alternative. Commercial pest control services would be able to use pyrotechnics or firearms in BDM programs and this activity would likely occur to a greater extent in the absence of WS's assistance. Hazards to humans and property could be greater under this alternative if personnel conducting BDM activities using nonchemical methods are poorly or improperly trained. It is hypothetically possible that frustration caused by the inability to alleviate bird damage could also lead to illegal use

of such methods. Several Local governments in Kentucky require special waivers of existing urban firearms or projectile laws before some nonchemical methods equipment, such as pellet rifles, shotguns, or pyrotechnic launchers can be used.

5.1.3.3 Effects on Human Health by Injurious Birds for Which BDM Is Requested by Alternative

Alternative 1 - Continue the Current Program (Proposed Action)

As discussed in Chapter 1, feral domestic pigeons, European starlings, blackbirds, and English sparrows can all carry or be involved in the cycle of diseases that are transmittable to humans and that can adversely affect human health. In most cases, it is difficult to conclusively prove that birds were responsible for transmission of individual human cases or outbreaks of bird-borne diseases. Nonetheless, certain requesters of BDM service may consider this risk to be unacceptable and may request such service primarily for that reason. In such cases, BDM, either by lethal or nonlethal means, would, if successful, reduce the risk of bird-borne disease transmission at the site for which BDM is requested.

In some situations such as those involving urban feral domestic pigeons and European starlings, the implementation of nonlethal controls such as electric or porcupine wires, netting barriers, and harassment dispersal in the case of European starlings, etc. could actually increase the risk of human health problems at other sites by causing the birds to move to other urban roosting sites not previously affected. In such cases, lethal removal of the birds may actually be the best alternative from the standpoint of overall human health concerns in the local area.

Aside from human health concerns, another reason lethal removal may be a better alternative is that the costs of nonlethal exclusion would likely have to be borne at each new site where the displaced birds reestablished roosting and nesting habits. The costs of installing and maintaining nonlethal exclusion methods at multiple sites could be much greater, even over the long term, than the cost of periodic lethal control using DRC-1339.

Alternative 2 - Nonlethal BDM Only by WS

Under this alternative, WS would be restricted to implementing only nonlethal methods in providing assistance with bird damage problems. Entities requesting BDM assistance for human health concerns would only be provided information on nonlethal barriers or exclusion devices, habitat alteration, or other nonlethal methods such as harassment. Because some of these nonlethal methods would likely be effective at the individual sites where they are used, this alternative would likely create or increase human health risks at other locations to where the birds would then move. Some requesting entities such as city government officials would reject WS assistance for this reason and would likely seek to achieve bird control (e.g., urban pigeon problems) by other means. Because DRC-1339 would not be available for use by non-WS personnel, it may be difficult to achieve local population reduction. In such cases, human health risks may remain the same or become worse. Also, under this alternative, human health problems would probably increase if private individuals were unwilling to implement nonlethal control methods because of high

cost or lack of faith in their effectiveness, or if they were unable to hire other entities to conduct effective BDM for human health concerns.

Alternative 3 - Technical Assistance Only

With WS technical assistance but no direct operational assistance, entities requesting BDM for human health concerns would either (1) not take any action which means the risk of human health problems would continue or would increase in each situation as European starling or pigeon numbers maintained or increased, (2) implement WS recommendations for nonlethal barriers and exclusions site-by-site, which would most probably result in European starlings or pigeons relocating to other buildings, structures, or tree roosts in the case of European starlings, and thereby creating or increasing human health risks at new sites, or (3) undertake or hire European starling or pigeon control using cage traps, shooting, or Avitrol. DRC-1339 would not be available for use except by certified applicators under the direct supervision of WS personnel. Under this alternative, human health problems could increase if private individuals were unable to achieve effective BDM with technical assistance alone, or if they were unable to hire other entities to conduct effective BDM for human health concerns.

Alternative 4 - No Federal WS Bird Damage Management

With no WS assistance, private individuals and community government officials would either (1) not take any action which means the risk of human health problems would continue or would increase in each situation as European starling or pigeon numbers maintained or increased, (2) implement nonlethal barriers and exclusions site-by-site, which would most probably result in European starlings or pigeons relocating to other buildings, structures, or tree roosts, in the case of European starlings, and thereby creating or increasing human health risks at new sites, or (3) undertake or hire European starling or pigeon control using cage traps, shooting, or Avitrol. A primary difference between this alternative and the proposed action is that DRC-1339 would not be available. Under this alternative, human health problems could increase if private individuals were unable to find and implement effective means of controlling pigeons or other birds that cause similar types of damage problems.

5.1.4 Effects on Aesthetics

5.1.4.1 Effects on Human Affectionate-Bonds With Individual Birds and On Aesthetic Values of Wild Bird Species

Alternative 1 - Continue the Current Program (Proposed Action)

Some people who routinely view or feed individual birds such as feral domestic pigeons or urban waterfowl would likely be disturbed by removal of such birds under the current program. WS is aware of such concerns and has taken it into consideration in some cases to mitigate them. For example, in a recent situation involving nuisance duck damage to property as a result of droppings, at least one adjacent homeowner who enjoyed viewing feral domestic ducks on one of the water course areas was concerned that WS would remove the ducks she was accustomed to seeing and feeding. WS agreed not to remove the ducks. In yet another instance involving damage by geese, WS received a request to leave a few geese for the benefit of those who enjoyed

observing and feeding them. WS subsequently live captured and translocated more than 50 geese but left seven as requested. This type of consideration can help to mitigate adverse effects on local peoples' enjoyment of certain individual birds or groups of birds.

Some people have expressed opposition to the killing of any birds during BDM activities. Under the current program, some lethal control of birds would continue and these persons would continue to be opposed. However, many persons who voice opposition have no direct connection or opportunity to view or enjoy the particular birds that would be killed by WS's lethal control activities. Lethal control actions would generally be restricted to local sites and to small, unsubstantial percentages of overall populations. Therefore, the species subjected to limited lethal control actions would remain common and abundant and would therefore continue to remain available for viewing by persons with that interest.

Alternative 2 - Nonlethal BDM Only by WS

Under this alternative, WS would not conduct any lethal BDM but would still conduct harassment of European starlings, blackbirds, some geese, and other birds that were causing damage. In addition, WS could live-capture waterfowl such as feral domestic or Canada geese, and ducks, and translocate them to wild sites in Kentucky. Some people who oppose lethal control of wildlife by government but are tolerant of government involvement in nonlethal wildlife damage management would favor this alternative. Persons who have developed affectionate bonds with individual wild birds would not be affected by the death of individual birds under this alternative, but might oppose dispersal or translocation of certain birds. As discussed in this Subsection under Alternative One, WS might sometimes be able to mitigate such concerns by leaving certain birds which might be identified by interested individuals. In addition, the abundant populations of European starlings, blackbirds, geese and ducks in urban environments would enable people to continue to view them and to establish affectionate bonds with individual wild birds. Although WS would not perform any lethal activities under this alternative, other private entities would likely conduct BDM activities similar to those that would no longer be conducted by WS, which means the effects would then be similar to the current program alternative.

Alternative 3 - Technical Assistance Only

Under this alternative, WS would not conduct any direct operational BDM but would still provide technical assistance or self-help advice to persons requesting assistance with bird damage. WS would also not conduct any harassment of European starlings, blackbirds, geese or other birds that were causing damage. Some people who oppose direct operational assistance in wildlife damage management by the government but favor government technical assistance would favor this alternative. Persons who have developed affectionate bonds with individual wild birds would not be affected by WS's activities under this alternative because the individual birds would not be killed by WS. However, other private entities would likely conduct BDM activities similar to those that would no longer be conducted by WS, which means the effects would then be similar to the current program alternative.

Alternative 4 - No Federal WS Bird Damage Management

Under this alternative, WS would not conduct any lethal removal of birds nor would the program

conduct any harassment of European starlings, blackbirds, geese or other birds. Some people who oppose any government involvement in wildlife damage management would favor this alternative. Persons who have developed affectionate bonds with individual wild birds would not be affected by WS's activities under this alternative. However, other private entities would likely conduct BDM activities similar to those that would no longer be conducted by WS, which means the effects would then be similar to the current program alternative.

5.1.4.2 Effects On Aesthetic Values of Property Damaged by Birds

Alternative 1 - Continue the Current Program (Proposed Action)

Under this alternative, operational assistance in reducing nuisance pigeon and other bird problems in which droppings from the birds cause unsightly mess would improve aesthetic values of affected properties in the view of property owners and managers. In addition, individuals who object to the presence of invasive nonnative species, such as European starlings, domestic feral pigeons, and English sparrows, and whose aesthetic enjoyment of other birds is diminished by the presence of such species, will be positively affected by programs which result in reductions in the presence of such birds.

Relocation or dispersal of nuisance roosting or nesting populations of birds (e.g., blackbird/starling roosts, heron rookeries) by harassment can sometimes result in the birds causing the same or similar problems at the new location. If WS is providing direct operational assistance in relocating such birds, coordination with local authorities who may assist in monitoring the birds' movements is generally conducted to assure they do not reestablish in other undesirable locations.

Live capture and translocation of damaging waterfowl by WS would aesthetically improve sites such as residential neighborhoods, business parks, recreational parks, and public property since such relocation of offending birds would reduce droppings and sometimes alleviate damage to lawns and water bodies. However, removal of some geese or ducks might reduce opportunities for the public to view the birds at those sites. Some people might therefore, object to capturing birds and transporting them elsewhere. With populations of waterfowl in urban areas at unprecedented numbers in Kentucky, those who wish to view these species should be able to find them in abundance nearby and would still be able to pursue this pastime without undue difficulty. In addition, rarely does a WS BDM action related to waterfowl result in the removal of all birds from one site, and, as discussed elsewhere, new birds often quickly move into an area where birds have been removed.

Lethal removal of birds, including geese and ducks, from airports should not affect the public's enjoyment of the aesthetics of the environment since airport property is closed to the public and access to view birds at these sites is either restricted to viewing from a location outside boundary fences or is forbidden, and feeding of wildlife on airports is usually forbidden.

Alternative 2 - Nonlethal BDM Only by WS

Under this alternative, WS would be restricted to nonlethal methods only. Nuisance pigeon problems would have to be resolved by nonlethal barriers and exclusion methods. Assuming

property owners would choose to allow and pay for the implementation of these types of methods, this alternative would result in nuisance pigeons and other birds relocating to other sites where they would likely cause or aggravate similar problems for other property owners. Thus, this alternative would most likely result in more property owners experiencing adverse effects on the aesthetic values of their properties than the current program alternative.

Alternative 3 - Technical Assistance Only

Under this alternative, the lack of operational assistance in reducing nuisance pigeon and other bird problems would mean aesthetic values of some affected properties would continue to be adversely affected, but this would not occur to as great a degree as under the No Program alternative. This is because some of these property owners would be able to resolve their problems by following WS's technical assistance recommendations.

Relocation of nuisance roosting or nesting population of birds (e.g., blackbird/starling roosts, heron rookeries) through harassment, barriers, or habitat alteration can sometimes result in the birds causing the same problems at the new location. If WS has only provided technical assistance to local residents or municipal authorities, coordination with local authorities to monitor the birds' movements to assure the birds do not reestablish in other undesirable locations might not be conducted. In addition technical assistance only could result in a greater chance of adverse effects on aesthetics of property owners at other locations than the current program alternative.

Alternative 4 - No Federal WS Bird Damage Management

Under this alternative, the lack of any operational or technical assistance in reducing nuisance pigeon and other bird problems in which droppings from the birds cause unsightly mess would mean aesthetic values of some affected properties would continue to be adversely affected if the property owners were not able to achieve BDM some other way. In many cases, this type of aesthetic "damage" would worsen because property owners would not be able to resolve their problems and bird numbers would continue to increase.

5.1.5 Humaneness of Lethal Bird Control Methods

5.1.5.1 Alternative 1 - Continue the Current Program (Proposed Action)

Under this alternative, methods viewed by some persons as inhumane would continue to be used in BDM by WS. These methods would include shooting and toxicants/chemicals such as DRC-1339 and Avitrol.

Shooting, when performed by experienced professionals, usually results in a quick death for target birds. Occasionally, however, some birds are initially wounded and must be shot a second time or must be caught by hand and then dispatched or euthanized. Some persons would view shooting as inhumane.

The primary lethal chemical BDM method that would be used by WS under this alternative would be DRC-1339. This chemical causes a quiet and apparently painless death that results from

uremic poisoning and congestion of major organs (Decino et al. 1966). The birds become listless and lethargic, and a quiet death normally occurs in 24 to 72 hours following ingestion. However, the method appears to result in a less stressful death than that which probably occurs by most natural causes which are primarily disease, starvation, and predation. For these reasons, WS considers DRC-1339 use under the current program to be a relatively humane method of lethal BDM. However, despite the apparent painlessness of the effects of this chemical, some persons will view any method that takes a number of hours to cause death as inhumane and unacceptable.

The chemical Avitrol repels birds by poisoning a few members of a flock, causing them to become hyperactive (see discussion in Appendix B). Their distress calls generally alarm the other birds and cause them to leave the site. Only a small number of birds need to be affected to cause alarm in the rest of the flock. The affected birds generally die. In most cases where Avitrol is used, only a small percentage of the birds are affected and killed by the chemical with the rest being merely dispersed. In experiments to determine suffering, stress, or pain in affected animals Rowsell, et. al. (1979) tested Avitrol on pigeons and observed subjects for clinical, pathological, or neural changes indicative of pain or distress. None were observed. Conclusions of the study were that the chemical met the criteria for a humane pesticide. Notwithstanding, some persons would view Avitrol as inhumane treatment of the birds that are affected by it based on the birds' distress-like behavior.

Occasionally, birds captured alive by use of the tranquilizer Alpha-chloralose, cage traps, or by hand or with nets would be euthanized. The most common method of euthanization would be by decapitation, cervical dislocation or CO₂ gas which are described and approved by AVMA as humane euthanasia methods (AVMA 1993). Most people would view AVMA-approved euthanization methods as humane.

5.1.5.2 Alternative 2 - Nonlethal BDM Only by WS

Under this alternative, lethal methods viewed as inhumane by some persons would not be used by WS. However, it is expected that many requesters of BDM assistance would reject nonlethal methods recommended by WS and/or would not be willing to pay the extra cost of implementing and maintaining them and would seek alternative lethal means.

Since DRC-1339 would not be available to non-WS entities, the only chemical BDM method that could be legally used by these entities would be Avitrol. Avitrol would most likely be viewed as less humane than DRC-1339 because of the distress behaviors that it causes.

Shooting could be used by non-WS entities and, similar to the current program alternative, would be viewed by some persons as inhumane.

Alpha-chloralose would not be available to non-WS entities. However, live trapping/capture by other methods and euthanization by decapitation, cervical dislocation or CO₂ gas could be used by these entities.

Overall, it is likely that BDM would actually be somewhat less humane with this alternative than under the current program alternative.

5.1.5.3 Alternative 3 - Technical Assistance Only

Under this alternative, WS would not conduct any lethal or nonlethal BDM, but would provide self-help advice only. Thus, lethal methods viewed as inhumane by some persons would not be used by WS.

Without WS direct operational assistance, it is expected that many requesters of BDM would reject nonlethal recommendations or would not be willing to pay the extra cost of implementing and maintaining them and would seek alternative lethal means.

Similar to Alternative 2, DRC-1339 would no longer be available for use since it is only registered for use by or under the direct supervision of WS personnel. Thus, the only chemical BDM method legally available would be Avitrol which would be viewed by many persons as less humane than DRC-1339.

The other lethal method that would likely be used more by non-WS entities would be shooting, which would also be viewed by some persons as inhumane.

Alpha-chloralose would not be available to non-WS entities. However, live trapping/capture by other methods and euthanization by decapitation, cervical dislocation or CO₂ gas could be used by these entities.

Overall, BDM under this alternative would likely be somewhat less humane than the current program alternative but slightly more humane than Alternative 2.

5.1.5.4 Alternative 4 — No Federal WS Bird Damage Management

Under this alternative, lethal methods viewed as inhumane by some persons would not be used by WS. However, it is expected that many requesters of BDM assistance would reject the use of nonlethal methods as being impractical or too expensive to implement and maintain, and would seek alternative lethal means.

Similar to Alternative 2, DRC-1339 would no longer be available for use since it is only registered for use by or under the direct supervision of WS personnel. Thus, the only chemical BDM method legally available would be Avitrol which would be viewed by many persons as less humane than DRC-1339. In these situations, BDM would most likely be less humane than under the current program alternative.

Shooting could be used by non-WS entities and, similar to the current program alternative, would be viewed by some persons as inhumane.

Alpha-chloralose would not be available to non-WS entities. However, live trapping/capture by other methods and euthanasia by decapitation, cervical dislocation or CO₂ gas could be used by these entities.

Overall, it is likely that BDM would actually be somewhat less humane with this alternative than under the current program alternative, somewhat less humane than under Alternative 2, and somewhat less humane than under Alternative 3.

5.2 CUMULATIVE IMPACTS OF BDM METHODS BY ALTERNATIVE

Cumulative impacts, as defined by CEQ (40 CFR 1508.7), are impacts to the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts may result from individually minor, but collectively significant, actions taking place over time. The potential for cumulative impacts for all four alternatives presented in this EA is examined in the following Subsections.

5.2.1 Alternative 1 - Continue the Current Program (Proposed Action)

Under the current program, WS addresses damage associated with birds in a number of situations throughout the State and is expected to continue at the present level or to increase slightly in the near future. The WS BDM program is the primary Federal program with BDM responsibilities, but some State and Local government agencies may conduct BDM activities in Kentucky. Through ongoing coordination with these agencies, WS is aware of such BDM activities and sometimes provides technical assistance in such efforts. WS does not normally conduct direct damage management activities concurrently with such agencies in the same area but may conduct BDM activities at adjacent sites within the same time frame. In addition, commercial pest control companies may conduct BDM activities in the same area. The potential cumulative impacts analyzed below could occur either as a result of WS BDM program activities over time, or as a result of the aggregate effects of those activities combined with the activities of other agencies and individuals.

5.2.1.1 Cumulative Impact Potential From Chemical Components of Alternative 1

BDM programs which include lethal population management components using pesticides may have the greatest potential for cumulative impacts on the environment as such impacts relate to deposit of chemical residues in the physical environment and environmental toxicosis. The avicide DRC-1339 and the frightening agent Avitrol are the only two chemicals used in the Kentucky WS BDM program for the purpose of obtaining lethal effects on birds. These two chemicals have been evaluated for possible residual effects which might occur from buildup of the chemicals in soil, water, or other environmental sites. DRC-1339 exhibits a low persistence in soil or water, and bioaccumulation of the chemical is unlikely (USDA 1994). In addition, the relatively small quantity of DRC-1339 used in BDM programs in Kentucky, the chemical's instability which results in speedy degradation of the product (see Subsection 5.1.3.1 and Appendix B), and application protocol used in WS programs further reduces the likelihood of any environmental accumulation. DRC-1339 is not used by any other entities in Kentucky.

In BDM programs in Kentucky, WS uses Avitrol in small quantities (see Subsection 5.1.3.1 and Appendix B). During FY 1997-99 WS used an average of 35.17 grams (1.23 ounces) of Avitrol per year. A typical application involves the use of less than .25 grams (.009 ounces)

of technical chemical. Most applications are never in contact with soil, no applications are in contact with surface or ground water, and uneaten baits are recovered and disposed of according to EPA label specifications.

Avitrol is also used occasionally by KDA and by various pest control companies in Kentucky to address damage associated with birds such as domestic feral pigeons, European starlings, and English sparrows. KDA used a total of approximately 21.43 grams (.75 ounces) of technical Avitrol in corn bait formulations at all sites in Kentucky during calendar year 1999. Previous years of applications were similar or less (J. Custer, KDA Pers. Comm. 2000). None of these applications were distributed as soil-contact applications and uneaten baits were recovered and disposed of according to label specifications.

No precise usage data was available for commercial pest control operators regarding use of Avitrol by them in Kentucky. However, Oldham Chemical Company (Pers. Comm. 2000) and Van Watters and Rogers (J. Delaney, Van Watters and Rogers, Pers. Comm. 2000), two of the largest distributors of Avitrol to Kentucky pest control companies, reported the total sales of 49.998 grams (1.75 ounces) of technical Avitrol in all formulations to Kentucky pest control operators in calendar year 1999. Total usage of technical Avitrol by all applicators in Kentucky, including the WS BDM program, for all sites, was probably less than 150 grams (3.73 ounces).

Avitrol exhibits a high persistence in soil and water but, according to literature, does not bioaccumulate (USDA 1994 and EXTOXNET 2000). Because of Avitrol's characteristic of binding to soils it is not expected to be present in surface or ground water as a result of its use on land (EPA 1980). A combination of chemical characteristics and baiting procedure used by WS reduces the likelihood of environmental accumulation of Avitrol as a result of its use in WS BDM programs in Kentucky. The EPA has not required studies on the fate of Avitrol in the soil because, based on use patterns of the avicide, soil residues are expected to be low (EPA 1980).

Based on use patterns, chemical and physical characteristics of pesticides used in Kentucky BDM programs, and factors related to environmental fate of DRC-1339 and Avitrol, no cumulative impacts are expected from this lethal chemical components used in the WS BDM program.

Non-lethal chemicals used in the Kentucky BDM program are discussed in Subsection 4.2.4 and in Appendix B. Characteristics of these chemicals and use patterns by those who employ them in Kentucky indicate that no significant cumulative impacts related to environmental fate are expected from their use in BDM programs in the State.

Another potential cumulative impact related to the use of chemical methods in the current Kentucky BDM program is the potential for such techniques to have adverse effects on populations of target or nontarget species, including T & E species. Aspects of current Kentucky BDM program methods and a discussion of current trends in potentially affected bird populations is presented in detail in Subsections 5.1.1 and 5.1.2. As discussed, current program activities have had no observable cumulative effects on bird populations in the state for the past three fiscal years. Trends indicate that bird populations of potentially affected

species have either increased, remained stable, or decreased slightly for Kentucky and the Eastern BBS region

5.2.1.2 Cumulative Impact Potential From Non-Chemical Components of Alternative 1

Nonchemical methods of the WS BDM program in Kentucky may include exclusion through use of various barriers, habitat modification of structures or vegetation, live trapping and translocation or euthanasia of birds, harassment dispersal of birds or bird flocks, and shooting of some birds.

Because shooting is one component of the nonchemical WS BDM program in Kentucky, the deposition of lead shot in the environment is a factor considered in this EA.

Threats of lead toxicosis to waterfowl from the deposition of lead shot in waters where such species fed were observed more than one hundred years ago (Sanderson and Belrose 1986). As a result of discoveries made regarding impacts to several species of ducks and geese, Federal restrictions were placed on the use of lead shot for waterfowl hunting in 1991. Regulations regarding this are found in 50CFR20.21. KDFWR addresses the use of lead shot related to waterfowl hunting in 301 KAR 2:222E Waterfowl Hunting Requirements. Language used by 301KAR 2:222E states that "a waterfowl hunter shall not use or carry a shotgun shell: (2) containing shot: (a) made of lead (b) not approved by the U. S. Fish and Wildlife Service for waterfowl hunting...." Comparable language in 50CFR20.21 directs hunters that: "While possessing shot (either in shotshells or as loose shot for muzzleloading) other than steel shot, or bismuth-tin (97 parts bismuth: 3 parts tin with 1 percent residual lead) shot, or tungsten-iron (40 parts tungsten: 60 parts iron with 1 percent residual lead) shot, or tungsten-polymer (95.5 parts tungsten: 4.5 parts Nylon 6 or 11 with 1 percent residual lead) shot, or tungsten matrix (95.5 parts tungsten: 4.1 parts polymer with 1 percent residual lead) shot or such shot approved as nontoxic by the Director pursuant to procedures set forth in 20.134, provided that: (1) This restriction applies only to the taking of Anatidae (ducks, geese [including brant] and swans), coots (*Fulica americana*) and any species that make up aggregate bag limits during concurrent seasons with the former in areas described in Sec. 20.108 as nontoxic shot zones...." Nontoxic shot zones are defined in 50CFR20.108 in the following citation: "Beginning September 1, 1991, the contiguous 48 United States, and the States of Alaska and Hawaii, the Territories of Puerto Rico and the Virgin Islands, and the territorial waters of the United States, are designated for the purpose of Sec. 20.21 (j) as nontoxic shot zones for hunting waterfowl, coots, and certain other species. 'Certain other species' refers to those species, other than waterfowl or coots, that are affected by reason of being included in aggregate bags and concurrent seasons."

All WS BDM shooting activities conform to Federal, State and Local laws. In some programs WS sometimes finds it necessary to shoot waterfowl under existing permits granted by USFWS (See Subsection 1.7.2.3), usually in airport wildlife hazard management programs where ducks or geese near aircraft operations jeopardize air passenger safety. If such activities are conducted near or over water, WS uses steel shot during activities. Consequently, no deposition of lead in nontoxic shot zones occurs as a result of WS BDM actions in Kentucky. No cumulative impacts are expected therefore, related to toxic shot and

shooting as a method in the Kentucky WS BDM program. In addition, WS will evaluate other BDM actions which entail the use of shot on a case by case basis to determine if deposition of lead shot poses any risk to nontarget animals, such as domestic livestock, in scenarios such as that discussed in Subsection 2.3.2. If such risk exists, WS will use nontoxic shot in those situations.

Some potential exists for cumulative impacts to human health and safety related to harassment of roosting bird flocks such as American crows, blackbirds, and European starlings in urban environments. If birds are dispersed from one site and relocate in another where human exposure to concentrations of bird droppings over time occurs, human health and safety threats can occur (See Subsection 1.3.2). However, WS uses IWDM strategies to address such bird damage in Kentucky. Such strategies may result in the implementation of either or both of the following: habitat modifications to problem areas or population reductions of American crow, blackbird and European starling numbers which are causing human health and safety impacts. The potential for harassment/dispersal and subsequent relocation of flocks of birds to produce cumulative impacts as a result of their presence in areas of human use is therefore reduced or eliminated by the overall WS BDM strategy. Consequently, no cumulative impacts are expected from the use of harassment or other dispersal methods which might relocate flocks of roosting American crows, blackbirds, or European starlings to other human-occupied sites.

No cumulative impacts affecting target or nontarget species of wildlife, including threatened and endangered species, are expected as a result of this alternative.

5.2.2 Alternative 2 - Nonlethal BDM Only by WS

Under this alternative, WS would be restricted to implementing only nonlethal methods in providing assistance with bird damage problems. Entities requesting BDM assistance for damage concerns would only be provided information on nonlethal barriers or exclusion devices, habitat alteration, or other nonlethal methods such as harassment for most species. An exception might be that nonlethal live-capture and translocation of migratory waterfowl and harassment dispersal of European starling and blackbird roosts could still be performed by WS.

Because some of these nonlethal methods would likely be effective at the individual sites where they were used, this alternative would likely create or increase human health risks and property damage at other locations where the birds would be moved. Because of this likelihood a nonlethal only program by WS might result in increasing and recurrent problems of this nature. The scope of human health threats and property damage could conceivably increase as birds causing damage continued to increase in numbers and occupy areas of human use. However, no cumulative impacts directly related to the chemical or nonchemical methods used under this alternative would be expected.

No cumulative impacts affecting target or nontarget species of wildlife, including threatened and endangered species, are expected as a result of this alternative.

5.2.3. Alternative 3 - Technical Assistance Only

With WS technical assistance but no direct operational assistance, entities requesting BDM for human health and safety concerns, property, agricultural, or natural resource damage would either (1) not take any action which means the risk of damage by birds would continue or would increase in each situation as numbers of damaging birds maintained or increased, (2) implement WS recommendations for nonlethal barriers and exclusions site-by-site, which would probably result in some birds such as European starlings, pigeons, or English sparrows relocating to other buildings, structures, or tree roosts in the case of European starlings and English sparrows, and thereby creating or increasing damage risks at new sites, or (3) undertake or hire bird damage control using dispersal methods, cage traps, shooting, or Avitrol. Under this alternative bird-caused damage could increase if private individuals were unable to achieve effective BDM with technical assistance alone, or if they were unable to hire other entities to conduct effective BDM. This could result in cumulative damage effects to human health and safety, property, agriculture, or natural resources similar to Alternative 2.

Some cumulative impacts to waterfowl populations might occur from implementation of this alternative. Under this alternative, urban populations of ducks and geese could be expected to increase, which normally results in an increase in levels of certain waterfowl diseases such as avian cholera and botulism (Davidson and Nettles 1997), which are lethal to such species.

5.2.4 Alternative 4 - No Federal WS Bird Damage Management

With no WS assistance, private individuals, communities, and government officials might either (1) not take any action which means the risk of bird caused damage could continue or increase in each situation as damaging bird species numbers maintained or increased, (2) implement environmental manipulation in the form of tree-cutting or thinning, installation of nonlethal barriers and exclusionary devices site-by-site, and cease growing crops, or change to other crop types in the case of agricultural damage, which might result in damaging birds relocating to other buildings, structures, farms or crop fields, or tree roosts, and thereby creating or increasing human health risks, or crop or property damage at new sites, or (3) undertake or hire bird damage management using various exclusionary or bird-dispersal techniques, cage traps, shooting, or Avitrol. A primary difference between this alternative and the proposed action is that DRC-1339 would not be available. Under this alternative, bird damage problems could increase if private individuals were unable to find and implement effective means of controlling those species causing damage. This increase might result in cumulative impacts to agriculture, human health and safety, property, or natural resources as a result of increased levels of unresolved bird damage.

Some cumulative impacts to waterfowl populations might occur from implementation of this alternative. Under this alternative, urban populations of ducks and geese could be expected to increase, which normally results in an increase in levels of certain waterfowl diseases such as avian cholera and botulism (Davidson and Nettles 1997), which are lethal to such species.

No cumulative impacts affecting nontarget species of wildlife, including threatened and endangered species, are expected as a result of this alternative.

Table 5-3 summarizes the expected effects of each of the alternatives on each of the issues.

Table 5-3. Relative Comparison of Anticipated Effects From Alternatives In This EA.

Issues/Effects	<i>Alt. 1 Current Program</i>	<i>Alt. 2 Nonlethal Only</i>	<i>Alt. 3 Technical Assistance (TA) Only</i>	<i>Alt. 4 No Federal Program</i>
Target Species Effects	Low effect - reductions in bird numbers would not significantly affect species populations.	Low effect - reductions in bird numbers would not occur or would also be insignificant.	Low effect - reductions in bird numbers may occur but would also be insignificant to populations. Possible cumulative effects to waterfowl through overpopulation and disease threat in urban areas	Low effect - reductions in bird numbers less likely w/o WS assistance, but would be insignificant to populations if they occurred. Possible cumulative effects to waterfowl through overpopulation and disease threat in urban areas
Effects to Non-target Species	Low effect - methods used by WS would be highly selective with very little risk to nontarget species.	Low effect but greater than Alt. 1 - people with bird problems may resort to less selective lethal methods if they reject recommended nonlethal methods.	Low effect but greater than Alt. 1, but less than Alt. 2 - people with bird problems may resort to less selective lethal methods, but less likely with WS TA.	Low effect but greater than Alts. 1, 2, or 3 - people with bird problems may resort to less selective lethal methods w/o WS assistance.
Human Health and Safety - Risks of Adverse Effects from BDM Methods	Low risk - methods used by WS would be safe with no probable risk of human health or safety effects.	Low risk but slightly greater than Alt. 1 - people with bird problems may resort to illegal lethal chemical or other methods that pose human health/safety risks.	Low risk but slightly greater than Alt. 1, slightly less than Alt. 2 - people with bird problems may resort to illegal lethal or other chemical methods that pose human health/safety risks; less likely with WS TA.	Low risk but greater than Alts. 1, 2, 3 - people with bird problems may resort to illegal lethal chemical or other methods that pose human health/safety risks; most likely w/o WS direct or TA assistance.
Human Health and Safety - Risks of Adverse Effects from Bird Damage	Low risk - bird damage problems most likely to be resolved without creating or moving problems elsewhere.	Higher Risk - e.g., pigeons and starlings would move to other sites which can create health risks at new sites. Possible cumulative effects.	Higher Risk, but less than Alt. 2 - e.g., TA recipients might be able to achieve pigeon removal, but less likely w/o WS direct assistance. Possible cumulative effects.	Higher Risk than Alt. 1, 2, but less than Alt. 3 - persons with BDM problems might be able to achieve success, but less likely w/o WS direct or TA assistance. Possible cumulative effects.
Aesthetic Enjoyment of Birds	Low to Moderate effect (at local levels only) - WS BDM does not adversely affect overall bird species populations but may be local reductions (e.g., feral pigeon BDM).	Low effect - bird numbers in BDM situations would remain high or would increase, unless nonlethal recommendations were rejected and bird numbers were reduced by non-WS entities.	Low effect (at local levels) - bird numbers in BDM situations would remain high or would increase unless TA recipients implemented lethal methods successfully.	Low effect - bird numbers in BDM situations would remain high or would increase unless bird numbers are reduced by non-WS entities.
Aesthetic Damage by Birds	Low effect - bird damage problems most likely to be resolved without creating or moving problems elsewhere.	Low to Moderate effect - e.g., pigeons would move to other sites which can create aesthetic damage problems at new sites.	High, greater than Alts. 1, 2 less than Alt. 4 - nuisance bird problems less likely to be resolved w/o WS assistance.	High - nuisance bird problems less likely to be resolved w/o WS assistance.
Humaneness of Lethal BDM Methods	Low to Moderate effect - methods viewed by some people as inhumane would be used, but current program would still be largely nonlethal.	Lower effect than Alt. 1 - but some people with bird problems may resort to other, less selective lethal methods than those used by WS.	Lower effect than Alt. 1, but greater than Alt. 2 - some people with bird problems may resort to other, less selective methods, but less likely with WS TA assistance.	Lower effect than Alt. 1, 3 but greater than Alt. 2 - some people with bird problems may resort to other, less selective methods w/o WS direct or TA assistance.

6.0 CHAPTER 6 - PREPARERS/REVIEWERS, PERSONS CONSULTED, AND PUBLIC INVOLVEMENT

6.1 LIST OF PREPARERS / REVIEWERS

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6.3 PUBLIC INVOLVEMENT

The Pre-Decisional EA was available for public review and comment during a 40-day period (October 14 - November 20, 2000), which complies with or exceeds public involvement guidelines/policies contained in NEPA, CEQ regulations, and APHIS WS's Implementing Regulations, as well as all pertinent agency laws, regulations, and policies. A Legal Notice of Availability was placed in Louisville Courier Journal, a daily newspaper with geographic coverage of all of the proposed project area, for two days (October 14-15, 2000). EA's were made available for review at three locations including the Louisville, Kentucky WS District Office, and copies were available by request through the U.S. Mail.

The Pre-Decisional EA was mailed directly to organizations with probable interest in the proposed program: Humane Society of the United States, and The Fund For Animals.

Comments were solicited via mail and facsimile (FAX). Comments were received from one State agency. Comments were analyzed and evaluated, and clarifications and modifications were made in the text. All comments received from the public during this period were fully considered in development of the EA and Decision.

APPENDIX A

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APPENDIX B

**BIRD DAMAGE MANAGEMENT (BDM)
METHODS AVAILABLE FOR USE OR
RECOMMENDATION BY THE
KENTUCKY WILDLIFE SERVICES
PROGRAM**

NONLETHAL METHODS - NONCHEMICAL

Agricultural producer and property owner practices. These consist primarily of nonlethal preventive methods such as cultural methods and habitat modification. Cultural methods and other management techniques are implemented by the agricultural producer or property owners/managers. Resource owners/managers may be encouraged to use these methods, based on the level of risk, need, and professional judgement on their effectiveness and practicality. These methods include:

Cultural methods. These may include altering planting dates so that crops are not young and more vulnerable to damage when the damage-causing species is present, or the planting of crops that are less attractive or less vulnerable to such species (e.g., wintering geese). At feedlots or dairies, cultural methods generally involve modifications to the level of care or attention given to livestock which may vary depending on the age and size of the livestock. Animal husbandry practices include but are not limited to techniques such as night feeding, indoor feeding, closed barns or corrals, removal of spilled grain or standing water, and use of bird proof feeders (Johnson and Glahn 1994). Increased feed size may reduce consumption by European starlings but may not be cost effective for the producer (Twedt and Glahn 1984).

Environmental/Habitat modification can be an integral part of BDM. Wildlife production and/or presence is directly related to the type, quality, and quantity of suitable habitat. Therefore, habitat can be managed to reduce or eliminate the production or attraction of certain bird species or to repel certain birds. In most cases, the resource or property owner is responsible for implementing habitat modifications, and WS only provides advice on the type of modifications that have the best chance of achieving the desired effect. Habitat management is most often a primary component of BDM strategies at or near airports to reduce bird aircraft strike problems by eliminating bird nesting, roosting, loafing, or feeding sites. Generally, many bird problems on airport properties can be minimized through management of vegetation and water from areas adjacent to aircraft runways. Habitat management is often necessary to minimize damage caused by blackbirds and European starlings that form large roosts during late summer, autumn and winter. Bird activity can be greatly reduced at roost sites by removing all the trees or selectively thinning the stand. Roosts often will reform at traditional sites, and substantial habitat alteration is sometimes the only way to permanently stop such activity at a site (USDA 1994).

Animal behavior modification. This refers to tactics that alter the behavior of wildlife to reduce damage. Animal behavior modification may involve use of scare tactics or fencing to deter or repel animals that cause loss or damage (Twedt and Glahn 1982). Some but not all methods that are included in this category are:

- Bird-proof barriers
- Electronic guards
- Propane exploders
- Pyrotechnics
- Distress calls and sound producing devices
- Chemical frightening agents
- Repellents
- Scare crows
- Mylar tape

- Eye-spot balloons
- Harassment with a hovercraft
- Harassment with trained dogs

These techniques are generally only practical for small areas. Scaring devices such as distress calls, helium filled eye spot balloons, raptor effigies and silhouettes, mirrors, and moving disks can be effective but usually for only a short time before birds become accustomed and learn to ignore them (Arhart 1972, Rossbach 1975, Conover 1982, Shirota et al. 1983, Schmidt and Johnson 1984, Mott 1985, Graves and Andelt 1987, and Bomford 1990). Mylar tape has produced mixed results in its effectiveness to frighten birds (Dolbeer et al. 1986, Tobin et al. 1988).

Bird proof barriers can be effective but are often cost-prohibitive, particularly because of the aerial mobility of birds which requires overhead barriers as well as peripheral fencing or netting. Exclusion adequate to stop bird movements can also restrict movements of livestock, people and other wildlife (Fuller-Perrine and Tobin 1993). Heavy plastic strips hung vertically in open doorways have been successful in some situations in excluding birds from buildings used for indoor feeding or housing of livestock (Johnson and Glahn 1994). Plastic strips, however, can prevent or substantially hinder the filling of feed troughs or feed platforms at livestock feeding facilities. Such strips can also be covered up when the feed is poured into the trough by the feed truck. They are not practical for open-air feedlot operations that are not housed in buildings.

Monofilament wires can effectively deter gull use of specific areas where they are causing a nuisance (Blokpoel 1976; Belant and Ickes 1996). The birds apparently fear colliding with the wires and thus avoid flying into areas where the method has been employed. The WS program in Washington has effectively utilized steel wires to deter gulls from preying on salmon fingerlings at the base of dams.

Porcupine wire (e.g., Nixalite™, Catclaw™) is a mechanical repellent method that can be used to exclude pigeons and other birds from ledges and other roosting surfaces (Williams and Corrigan 1994). The sharp points inflict temporary discomfort on the birds as they try to land which deters them from roosting. Drawbacks of this method are that some pigeons have been known to build nests on top of porcupine wires, and the method can be expensive to implement if large areas are involved. Electric shock bird control systems are available from commercial sources and, although expensive, can be effective in deterring pigeons and other birds from roosting on ledges, window sills and other similar portions of structures (Williams and Corrigan 1994).

Auditory scaring devices such as propane exploders, pyrotechnics, electronic guards, scare crows, and audio distress/predator vocalizations are effective in many situations for dispersing damage-causing bird species. These devices are sometimes effective but usually only for a short period of time before birds become accustomed and learn to ignore them (Arhart 1972, Rossbach 1975, Shirota et al. 1983, Schmidt and Johnson 1984, Mott 1985, and Bomford 1990). Williams (1983) reported an approximate 50% reduction in blackbirds at two south Texas feedlots as a result of pyrotechnics and propane cannon use. However, they are often not practical in dairy or feedlot situations because of the disturbance to livestock, although livestock can generally be expected to habituate to the noise. Birds, too, quickly learn to ignore scaring devices if the birds' fear of the methods is not reinforced with shooting or other tactics.

Visual scaring techniques such as use of mylar tape (highly reflective surface produces flashes of light that startles birds), eye-spot balloons (the large eyes supposedly give birds a visual cue that a large predator is present), flags, effigies (scarecrows), sometimes are effective in reducing bird damage. Mylar tape has

produced mixed results in its effectiveness to frighten birds (Dolbeer et.al. 1986, and Tobin et.al. 1988). Birds quickly learn to ignore visual and other scaring devices if the birds' fear of the methods is not reinforced with shooting or other tactics.

Relocation of damaging birds to other areas following live capture generally would not be effective nor cost-effective. Relocation to other areas following live capture would not generally be effective because problem bird species are highly mobile and can easily return to damage sites from long distances, habitats in other areas are generally already occupied, and relocation would most likely result in bird damage problems at the new location. Translocation of wildlife is also discouraged by WS policy (WS Directive 2.501) because of stress to the relocated animal, poor survival rates, and difficulties in adapting to new locations or habitats.

However, there are exceptions to the rule for relocating birds. Relocation of damaging birds might be a viable solution and acceptable to the public when the birds were considered to have high value such as migratory waterfowl, raptors, or T&E species. In these cases, WS would consult with the USFWS and/or KDFWR to coordinate capture, transportation, and selection of suitable relocation sites.

Nest destruction is the removal of nesting materials during the construction phase of the nesting cycle. Nest destruction is generally only applied when dealing with a single bird or very few birds. This method is used to discourage birds from constructing nests in areas which may create nuisances for home and business owners. Heusmann and Bellville (1978) reported that nest removal was an effective but time-consuming method because problem bird species are highly mobile and can easily return to damage sites from long distances, or because of high populations. This method poses no imminent danger to pets or the public.

Live traps include:

Clover, funnel, and common pigeon traps are enclosure traps made of nylon netting or hardware cloth and come in many different sizes and designs, depending on the species of birds being captured. The entrance of the traps also vary greatly from swinging-door, one-way door, funnel entrance, to tip-top sliding doors. Traps are baited with grains or other food material which attract the target birds. WS' standard procedure when conducting pigeon trapping operations is to ensure that an adequate supply of food and water is in the trap to sustain captured birds for several days. Active traps are checked daily, every other day, or as appropriate, to replenish bait and water and to remove captured birds.

Decoy traps are used by WS for preventive and corrective damage management. Decoy traps are similar in design to the Australian Crow Trap as reported by Johnson and Glahn (1994) and McCracken (1972). Live decoy birds of the same species that are being targeted are usually placed in the trap with sufficient food and water to assure their survival. Perches are configured in the trap to allow birds to roost above the ground and in a more natural position. Feeding behavior and calls of the decoy birds attract other birds which enter and become trapped themselves. Active decoy traps are monitored daily, every other day, or as appropriate, to remove and euthanize excess birds and to replenish bait and water. Decoy traps and other cage/live traps, as applied and used by WS, pose no danger to pets or the public and if a pet is accidentally captured in such traps, it can be released unharmed.

Nest box traps may be used by WS for corrective damage management and are effective in capturing local breeding and post breeding European starlings and other targeted secondary cavity nesting birds

(DeHaven and Guarino 1969, Knittle and Guarino 1976). Nest box traps are effective in capturing local breeding and post breeding European starlings in limited areas (DeHaven and Guarino 1969; Knittle and Guarino 1976). Trapped birds are euthanized. Relocation to other areas following live capture would not generally be effective because problem bird species are highly mobile and can easily return to damage sites from long distances, habitats in other areas are generally already occupied, and relocation would most likely result in bird damage problems at the new location. Translocation of wildlife is also discouraged by WS policy (WS Directive 2.501) because of stress to the relocated animal, poor survival rates, and difficulties in adapting to new locations or habitats.

Mist nets are more commonly used for capturing small-sized birds such as English sparrows, finches, etc. but can be used to capture larger birds such as ducks and ring-neck pheasants or even smaller nuisance hawks and owls. It was introduced in to the United States in the 1950's from Asia and the Mediterranean where it was used to capture birds for the market (Day et al. 1980). The mist net is a fine black silk or nylon net usually 3 to 10 feet wide and 25 to 35 feet long. Net mesh size determines which birds can be caught and overlapping "pockets" in the net cause birds to entangle themselves when they fly into the net.

Cannon nets are normally used for larger birds such as pigeons, feral ducks, and waterfowl and use mortar projectiles to propel a net up and over birds which have been baited to a particular site. This type of net is especially effective for waterfowl that are flightless due to molting and other birds which are typically shy to other types of capture.

Bal-chatri traps are small traps used for capturing birds of prey such as hawks and eagles. Live bait such as pigeons, European starlings, rodents, etc. are used to lure raptors into landing on the trap (Hygnstrom and Craven 1994) where nylon nooses entangle their feet and hold the bird. The trap is made of chicken wire or other wire mesh material which is formed into a Quonset hut-shaped cage that holds the live bait. The outside top and sides are covered with many nooses consisting of strong, monofilament line or stiff nylon string.

Lure crops/alternate foods. When depredations cannot be avoided by careful crop selection or modified planting schedules, lure crops can sometimes be used to mitigate the loss potential. Lure crops are planted or left for consumption by wildlife as an alternative food source. This approach provides relief for critical crops by sacrificing less important or specifically planted fields. Establishing lure crops is sometimes expensive, requires considerable time and planning to implement, and may attract other unwanted species to the area. This method is part of the integrated BDM strategy for reducing crop damage by sandhill cranes and geese in some WS State programs (G. Littauer, WS Pers. Comm., 2000).

NONLETHAL METHODS - CHEMICAL

Mesuroil (Methiocarb or 4-methylthio-3,5-xylyl N-nethylcarbamate) is a 75% wettable powder aversive conditioning chemical is used for egg treatment to reduce predation on the eggs of protected, threatened or endangered species. It is a restricted use pesticide which is acutely toxic to birds, fish and aquatic invertebrates. Formulations used by WS for protection of eggs of species of concern are somewhat toxic to animals which feed upon them. Animals are made ill from food materials treated with methiocarb and tend to avoid feeding on items similar in appearance. By presenting treated eggs in locations at or near where species to be protected nest, it may be possible to condition corvid (crows and magpies) predators to avoid

feeding on similar looking eggs located in the same area. Such avoidance responses may be acquired over a period of time and may require repeated exposures in order to be maintained. Occasionally, birds may die after feeding upon treated eggs, but most birds exposed to treated eggs survive. Methiocarb is injected into the treated egg with a hypodermic needle and the egg is sealed. Eggs are marked as poison and EPA label specifications (Appendix E) for use of treated eggs provide for mitigation practices and procedures to protect non-target animals of concern from feeding on them. Methiocarb is approved for use only by APHIS Certified Applicators or persons under their direct supervision.

Methyl and di-methyl anthranilate (artificial grape flavoring used in foods and soft drinks for human consumption) could be used or recommended by WS as a bird repellent. Methyl and di-methyl anthranilate (MA) (artificial grape flavoring food additive) has been shown to be an effective repellent for many bird species, including waterfowl (Dolbeer et al. 1993). MA is also under investigation as a potential bird taste repellent. MA may become available for use as a livestock feed additive (Mason et.al. 1984; 1989). It is registered for applications to turf or to surface water areas used by unwanted birds. The material has been shown to be nontoxic to bees ($LD_{50} > 25$ micrograms/bee⁴), nontoxic to rats in an inhalation study ($LC_{50} > 2.8$ mg/L⁵), and of relatively low toxicity to fish and other invertebrates. MA is naturally occurring in concord grapes and in the blossoms of several species of flowers and is used as a food additive and perfume ingredient (Dolbeer et al. 1992; RJ Advantage, Inc. 1997). It has been listed as "Generally Recognized as Safe" (GRAS) by the FDA (Dolbeer et al. 1992).

Water surface and turf applications of MA are generally considered expensive. For example, the least intensive application rate required by label directions is 20 lbs. of product (8 lbs. active ingredient) per acre of surface water at a cost of about \$64/lb. with retreating required every 3-4 weeks (RJ Advantage, Inc. 1997). An example of the level of expense involved is a golf course in Rio Rancho, NM where it was estimated that treating four watercourse areas would cost in excess of \$25,000 per treatment for material alone. Cost of treating turf areas would be similar on a per acre basis. Also, MA completely degrades in about 3 days when applied to water (RJ Advantage, Inc. 1997) which indicates the repellent effect is short-lived.

Another potentially more cost effective method of MA application is by use of a fog-producing machine (Vogt 1997). The fog drifts over the area to be treated and is irritating to the birds while being nonirritating to any humans that might be exposed. Fogging applications must generally be repeated 3-5 times after the initial treatment before the birds abandon a treatment site (Dr. P. Vogt, RJ Advantage, Inc., pers. comm. 1997). Applied at a rate of about .25 lb./ acre of water surface, the cost is considerably less than when using the turf or water treatment methods.

MA is also being investigated as a livestock feed additive to reduce or prevent feed consumption by birds. Such chemicals undergo rigorous testing and research to prove safety, effectiveness, and low environmental risks before they would be registered by U.S. Environmental Protection Agency (EPA) or the Food and Drug Administration (FDA).

⁴ An LD_{50} is the dosage in milligrams of material per kilogram of body weight, or, in this case in micrograms per individual bee, required to cause death in 50% of a test population of a species.

⁵ An LC_{50} is the dosage in milligrams of material per liter of air required to cause death in 50% of a test population of a species through inhalation.

Particulate feed additives have been investigated for their bird-repellent characteristics. In pen trials, European starlings rejected grain to which charcoal particles were adhered (L. Clark, NWRC, Pers. Comm. 1999). If further research finds this method to be effective and economical in field application, it might become available as a bird repellent on livestock feed. Charcoal feed additives have been explored for use in reducing methane production in livestock and should have no adverse effects on livestock, on meat or milk production, or on human consumers of meat or dairy products (L. Clark, NWRC, pers. comm. 1999).

Other chemical repellents. A number of other chemicals have shown bird repellent capabilities. Anthraquinone, a naturally occurring chemical found in many plant species and in some invertebrates as a natural predator defense mechanism, has shown effectiveness in protecting rice seed from red-winged blackbirds and boat-tailed grackles (Avery et al. 1997). It has also shown effectiveness as a foraging repellent against Canada goose grazing on turf and as a seed repellent against brown-headed cowbirds (Dolbeer et al. 1998). Compounds extracted from common spices used in cooking and applied to perches in cage tests have been shown repellent characteristics against roosting European starlings (Clark 1997). Naphthalene (moth balls) was found to be ineffective in repelling European starlings (Dolbeer et al. 1988).

Tactile repellents. A number of tactile repellent products are on the market which reportedly deter birds from roosting on certain structural surfaces by presenting a tacky or sticky surface that the birds avoid. However, experimental data in support of this claim are sparse (Mason and Clark 1992). The repellency of tractile products is generally short-lived because of dust, and they sometimes cause aesthetic problems and expensive clean-up costs by running down the sides of buildings in hot weather.

Avitrol is a chemical frightening agent (repellent) that is effective in a single dose when mixed with untreated baits, normally in a 1:9 ratio. Avitrol, however, is not completely nonlethal in that a small portion of the birds are generally killed (Johnson and Glahn 1994). Prebaiting is usually necessary to achieve effective bait acceptance by the target species. This chemical is registered for use on pigeons, crows, gulls, blackbirds, European starlings, and English sparrows in various situations. Avitrol treated bait is placed in an area where the targeted birds are feeding and usually a few birds will consume a treated bait and become affected by the chemical. The affected birds then broadcast distress vocalizations and display abnormal flying behavior, thereby frightening the remaining flock away.

Avitrol is a restricted use pesticide that can only be sold to certified applicators and is available in several bait formulations where only a small portion of the individual grains carry the chemical. It can be used during anytime of the year, but is used most often during winter and spring. Any granivorous bird associated with the target species could be affected by Avitrol. Avitrol is water soluble, but laboratory studies demonstrated that Avitrol is strongly absorbed onto soil colloids and has moderately low mobility. Biodegradation is expected to be slow in soil and water, with a half-life ranging from three to 22 months. However, Avitrol may form covalent bonds with humic materials, which may serve to reduce its availability for intake by organisms from water, is nonaccumulative in tissues and rapidly metabolized by many species (Schafer 1991).

Avitrol is acutely toxic to avian and mammalian species, however, blackbirds are more sensitive to the chemical and there is little evidence of chronic toxicity. Laboratory studies with predator and scavenger species have shown minimal potential for secondary poisoning, and during field use only magpies and crows appear to have been affected (Schafer 1991). However, a laboratory study by Schafer et al. (1974) showed that magpies exposed to two to 3.2 times the published Lethal Dose (LD₅₀) in contaminated prey for 20 days were not adversely affected and three American kestrels that were fed contaminated blackbirds for seven to

45 days were not adversely affected. A formal Risk Assessment found no probable risk is expected for pets and the public, based on low concentrations and low hazards quotient value for nontarget indicator species tested on this compound (USDA 1994, Appendix P).

Avitrol use in the KY WS program has been extremely limited and discussion of this use is provided in Subsections 5.1.3.1 and 5.2.1.1.

Alpha-chloralose is a central nervous system depressant used as an immobilizing agent to capture and remove nuisance waterfowl and other birds. It is labor intensive and in some cases, may not be cost effective (Wright 1973, Feare et al. 1981), but is typically used in recreational and residential areas, such as swimming pools, shoreline residential areas, golf courses, or resorts. Alpha-chloralose is typically delivered as a well contained bait in small quantities with minimal hazards to pets and humans; single bread or corn baits are fed directly to the target birds. WS personnel are present at the site of application during baiting to retrieve the immobilized birds. Unconsumed baits are removed from the site following each treatment. Alpha-chloralose was eliminated from more detailed analysis in USDA (1994) based on critical element screening, therefore, environmental fate properties of this compound were not rigorously assessed. However, the solubility and mobility are believed to be moderate and environmental persistence is believed to be low. Bioaccumulation in plants and animal tissue is believed to be low. Alpha-chloralose is used in other countries as an avian and mammalian toxicant. The compound is slowly metabolized, with recovery occurring a few hours after administration (Schafer 1991). The dose used for immobilization is designed to be about two to 30 times lower than the LD₅₀. Mammalian data indicate higher LD₅₀ values than birds. Toxicity to aquatic organisms is unknown (Woronecki et al. 1990) but the compound is not generally soluble in water and therefore should remain unavailable to aquatic organisms. Factors supporting the determination of this low potential included the lack of exposure to pets, nontarget species and the public, and the low toxicity of the active ingredient. Other supporting rationale for this determination included relatively low total annual use and a limited number of potential exposure pathways. The agent is currently approved for use by WS as an Investigative New Animal Drug by the FDA rather than a pesticide.

LETHAL METHODS - MECHANICAL

Egg addling/destruction is a method of suppressing reproduction in local nuisance bird populations by destroying egg embryos prior to hatching. Egg addling is conducted by vigorously shaking an egg numerous times which causes detachment of the embryo from the egg sac. Egg destruction can be accomplished in several different ways, but the most commonly used methods are manually gathering eggs and breaking them, or by oiling or spraying the eggs with a liquid which covers the entire egg and prevents the egg from obtaining oxygen (see *Egg oiling* below). Although WS does not commonly use egg addling or destruction, it is a valuable damage management tool and has proven effective in some applications.

Shooting is more effective as a dispersal technique than as a way to reduce bird densities when large number of birds are present. Normally shooting is conducted with shotguns or air rifles. Shooting is a very individual specific method and is normally used to remove a single offending bird, or group of birds numbering less than 50 at one location. However, at times, a few birds could be shot from a flock to make the remainder of the birds more wary and to help reinforce nonlethal methods. Shooting can be relatively expensive because of the staff hours sometimes required (USDA 1994). It is selective for target species and may be used in conjunction with the use of spotlights, decoys, and calling. Shooting with shotguns, air rifles, or rim and center fire rifles is sometimes used to manage bird damage problems when lethal methods are determined to be appropriate. The birds are killed as quickly and humanely as possible. All firearm

safety precautions are followed by WS when conducting BDM activities and all laws and regulations governing the lawful use of firearms are strictly complied with.

Firearm use is very sensitive and a public concern because of safety issues relating to the public and misuse. To ensure safe use and awareness, WS employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every 3 years afterwards (WS Directive 2.615). WS employees who carry firearms as a condition of employment, are required to sign a form certifying that they meet the criteria as stated in the *Lautenberg Amendment* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence.

Sport hunting is sometimes recommended by WS as a viable damage management method when the target species can be legally hunted. A valid hunting license and other licenses or permits may be required by the KDFWR and USFWS for certain species. This method provides sport and food for hunters and requires no cost to the landowner. Sport hunting is occasionally recommended if it can be conducted safely for pigeon damage management around feedlots, dairies, airports, and other facilities. It is occasionally used for managing damage caused by European starlings, English sparrows, Canada geese, and other waterfowl.

Snap traps are modified rat snap traps used to remove individual woodpeckers, European starlings, and other cavity using birds. The trap treadle is baited with peanut butter or other food attractants and attached near the damage area caused by the offending bird. These traps pose no imminent danger to pets or the public, and are usually located in positions inaccessible to people and most non-avian animals. They are very selective because they are usually set in the defended territory of the target birds.

LETHAL METHODS - CHEMICAL

All chemicals used by WS are registered as required by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (administered by the EPA and KDA) or by the FDA. WS personnel that use restricted-use chemical methods are certified as pesticide applicators by KDA and are required to adhere to all certification requirements set forth in FIFRA and Kentucky pesticide control laws and regulations. Chemicals are only used on private, public, or tribal property sites with authorization from the property owner/manager.

CO₂ is sometimes used to euthanize birds which are captured in live traps and when relocation is not a feasible option. Live birds are placed in a container such as a plastic 5-gallon bucket or chamber and sealed shut. CO₂ gas is released into the bucket or chamber and birds quickly die after inhaling the gas. This method is approved as a euthanizing agent by the American Veterinary Medical Association. CO₂ gas is a byproduct of animal respiration, is common in the atmosphere, and is required by plants for photosynthesis. It is used to carbonate beverages for human consumption and is also the gas released by dry ice. The use of CO₂ by WS for euthanasia purposes is exceedingly minor and inconsequential to the amounts used for other purposes by the public.

Egg oiling is a method for suppressing reproduction of nuisance birds by spraying a small quantity of food grade vegetable oil or mineral oil on eggs in nests. The oil prevents exchange of gases and causes asphyxiation of developing embryos and has been found to be 96-100% effective in reducing hatchability. (Pochop 1998; Pochop et al. 1998). The method has an advantage over nest or egg destruction in that the incubating birds generally continue incubation and do not renest. The EPA has ruled that use of corn oil for this purpose is exempt from registration requirements under FIFRA. The Kentucky Pesticide Control Act,

however, requires the method to be registered for use in Kentucky. To be most effective, the oil should be applied anytime between the fifth day after the laying of the last egg in a nest and at least five days before anticipated hatching. This method is extremely target specific and is less labor intensive than egg addling.

DRC-1339 is the principal chemical method that would be used for starling/blackbird and pigeon damage management in the proposed action. For more than 30 years, DRC-1339 has proven to be an effective method of starling, blackbird, gull, and pigeon control at feedlots, dairies, airports, and in urban areas (West et al. 1967, Besser et al. 1967, Decino et al. 1966). Studies continue to document the effectiveness of DRC-1339 in resolving blackbird / starling problems at feedlots (West and Besser 1976, Glahn 1982, Glahn et al. 1987), and Blanton et al. (1992) reports that DRC-1339 appears to be a very effective, selective, and safe means of urban pigeon population reduction. Glahn and Wilson (1992) noted that baiting with DRC-1339 is a cost-effective method of reducing damage by blackbirds to sprouting rice. DRC-1339 is a slow acting avicide that is registered with the EPA for reducing damage from several species of birds, including blackbirds, European starlings, pigeons, crows, ravens, magpies, and gulls. DRC-1339 was developed as an avicide because of its differential toxicity to mammals. DRC-1339 is highly toxic to sensitive species but only slightly toxic to nonsensitive birds, predatory birds, and mammals. For example, European starlings, a highly sensitive species, require a dose of only 0.3 mg/bird to cause death (Royall et al. 1967). Most bird species that are responsible for damage, including European starlings, blackbirds, pigeons, crows, magpies, and ravens are highly sensitive to DRC-1339. Many other bird species such as raptors, sparrows, and eagles are classified as nonsensitive. Numerous studies show that DRC-1339 poses minimal risk of primary poisoning to nontarget and T&E species (USDA 1994). Secondary poisoning has not been observed with DRC-1339 treated baits. During research studies, carcasses of birds which died from DRC-1339 were fed to raptors and scavenger mammals for 30 to 200 days with no symptoms of secondary poisoning observed (Cunningham et al. 1981). This can be attributed to relatively low toxicity to species that might scavenge on blackbirds and European starlings killed by DRC-1339 and its tendency to be almost completely metabolized in the target birds which leaves little residue to be ingested by scavengers. Secondary hazards of DRC-1339 are almost nonexistent. DRC-1339 acts in a humane manner producing a quiet and apparently painless death. DRC-1339 is unstable in the environment and degrades rapidly when exposed to sunlight, heat, or

Table B-1. DRC-1339 Used by Kentucky WS During Three Concurrent Fiscal Years.

FY	EPA Reg.	Species	Quantity Used (grams)
1999	56228-10	Blackbirds/ European starlings	655
	56228-28	Pigeons	1109
	56228-29	American crows	0
1998	56228-10	Blackbirds/ European starlings	1097
	56228-28	Pigeons	1173
	56228-29	American crows	65
1997	56228-10	Blackbirds/ European starlings	1101
	56228-28	Pigeons	585
	56228-29	American crows	332

ultraviolet radiation. DRC-1339 is highly soluble in water but does not hydrolyze and degradation occurs rapidly in water. DRC-1339 tightly binds to soil and has low mobility. The half life is about 25 hours, which means it is nearly 100% broken down within a week, and identified metabolites (i.e., degradation chemicals) have low toxicity. Aquatic and invertebrate toxicity is low (USDA 1994). Appendix P of USDA (1994) contains a thorough risk assessment of DRC-1339 and the reader is referred to that source for a more complete discussion. That assessment concluded that no adverse effects are expected from use of DRC-1339.

DRC 1339 has several EPA Registration Labels (56228-10, 56228-17, 56228-28, 56228-29, and 56228-30) depending on the application or species involved in the BDM project. Kentucky WS used an average of 2,039 grams (4.5 pounds) of DRC-1339 per year for the past 3 years (Table C-1). The chemical was applied on both public and private lands for reduction of damage by pigeons (46.87%), blackbirds/European starlings (46.64%), and American crows (6.49%). (USDA-WS MIS Database). This use of DRC-1339 was addressed in WS EAs for four projects three of which evaluated its use in managing damage by feral domestic pigeons, and blackbirds and European starlings and one EA to evaluate Management of Property Damage and Hazards to Human Health and Safety Caused By Pigeons in the State of Kentucky (USDA 1997).

APPENDIX C

**PERMITS FOR WS BDM PROGRAMS
IN KENTUCKY**



FEDERAL FISH AND WILDLIFE PERMIT

1. PERMITTEE

KEITH BLANTON
USDA, APHIS, WILDLIFE SERVICE
441 DONELSON PIKE, SUITE 340
NASHVILLE, TN 37214

2. AUTHORITY-STATUTES
16 USC 703-712

REGULATIONS (Attached)
50 CFR Part 13
50 CFR 21.41

3. NUMBER

MB018937-3

AMENDMENT

4. RENEWABLE

☒ YES
☐ NO

5. MAY COPY

☒ YES
☐ NO

6. EFFECTIVE

09/01/2000

7. EXPIRES

12/31/2000

8. NAME AND TITLE OF PRINCIPAL OFFICER (If #1 is a business)

9. TYPE OF PERMIT

DEPREDAATION

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED

Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Puerto Rico, Tennessee, and Virgin Islands.

11. CONDITIONS AND AUTHORIZATIONS:

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL OR OTHER FEDERAL LAW.

C. VALID FOR USE BY PERMITTEE NAMED ABOVE.

D. Authorized to take (pursue, hunt, shoot, wound, kill, trap, capture, collect), possess and transport coots, mergansers, and migratory non-game birds (except bald and golden eagles and endangered and threatened species) to control depredations. This authorization shall include accidental take of any species authorized under this condition.

E. Authorized to trap (live trap or capture), possess, and transport migratory game birds and golden eagles provided they are released to the wild (except endangered and threatened species). This authorization shall include accidental take of waterfowl when permittee is using alpha chloralose for relocating waterfowl from one location to another, provided the permittee and all subpermittees have been properly trained and certified in the use of alpha chloralose. Accidental take of waterfowl must be reported to the issuing FWS office within 48 hours.

F. Authorized to take (collect or capture), possess, and transport dead or injured migratory birds and eagles for salvage purposes. Salvaged live birds must be delivered to the nearest state and federally permitted rehabilitation facility. Salvaged endangered or threatened species, as well as eagles must be reported to the issuing office within 48 hours.

G. If lethal chemical substances are to be used under this permit, the issuing officer will be notified 48 hours prior to the treatment.

H. Permittee may delegate the authorities granted in this permit to employees under his supervision providing they exercise these authorities only while on official duty and in the scope of their employment with Wildlife Services. The subpermittee who has been delegated this authority may not redelegate to other persons. The responsibilities to comply with the terms and conditions of this permit may not be delegated and the permittee remains completely responsible for all activities conducted under this permit. Permittee must notify the issuing office in writing of the names of all persons who have been delegated authority under this permit within 10 days of such delegations.

I. Any person exercising authorities under this permit shall have a copy of this permit on his person and display it upon request to any duly authorized state or federal officer.

J. A reasonable and concerted effort shall be made to dispose of all migratory birds taken pursuant to this permit in accordance with the following order of disposition: Return to the wild; retain or transfer to another government agency for official use with prior concurrence by the issuing office; donate or loan with prior approval by the issuing office; or destroy specimens by burial or incineration.

K. Maintain a record of activities conducted under authority of this permit in accordance with 50 CFR 13.46.

L. A report of activities conducted pursuant to this permit, including state and county, number of specimens, purpose, and method of take shall be submitted to the issuing office 30 days after the expiration date of this permit.

☒ ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS

ANNUAL REPORT DUE: 1/31

ORIGINAL

ISSUED BY

Carman P. [Signature]

TITLE

FOR: ARD REFUGES & WILDLIFE

DATE

09/14/2000

M. Authorized to take (shoot) the following additional migratory birds for depredation control purposes: 1000 mourning doves at electrical substations in Kentucky and Tennessee.

ORIGINAL

Revised 6/92

KENTUCKY NUISANCE WILDLIFE CONTROL COLLECTING PERMIT

This permit authorizes U.S. Dept. of Agriculture APHIS/Wildlife Services
(Company or individual name)

Federal Agency - USDA/APHIS/WS, 441 Donelson Pike, Suite 340

(address)

Nashville, TN 37214

502/582-5536 work

(address)

(zip code)

(phone no.)

and Bob Myers, Ed Penrod, Keith Blanton, David Lingo and all other wildlife services employees. (persons conducting collections)

to collect species of wildlife herein listed for the purpose of controlling nuisance animals.

Unless otherwise authorized, nuisance wildlife control permittees may not kill animals other than coyotes, ground hogs, moles, shrews, mice, rats, snakes, lizards, sparrows or starlings except during regular taking seasons as established by the Department of Fish and Wildlife Resources. Violation of fish and wildlife laws or regulations or the provisions of this permit by the permittee shall be grounds for revocation of the permit and its privileges, in addition to prosecution.

This permit does not authorize the collection of any species declared endangered or threatened by state or federal law. All collecting equipment, except firearms, while in use or being transported, must be marked with the permittee's name and address. Permittees should contact local conservation officers before collecting in the county.

delete:

SPECIES OR GROUPS OF ANIMALS SOUGHT: small mammals (excluding bats),
birds. Add: including non-endangered bats.

COLLECTING EQUIPMENT AUTHORIZED: live traps, steel traps, snap traps,
gun, mist nets (in buildings and urban areas only), snares, pits, cluster of
conventional trapping techniques drugged bait/toxicants.

COLLECTING LOCALITY: statewide.

Collectors must notify the Daniel Boone National Forest Supervisor when
collecting on National Forest Lands.

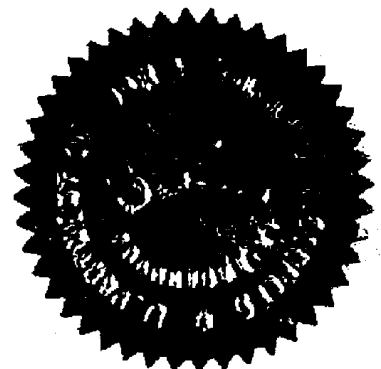
DISPOSITION OF SPECIMENS AND/OR SPECIAL CONDITIONS: All captured protected wildlife not in season or for which there is no season shall be immediately released in a rural habitat suitable to that species. This permit does not substitute for a hunting and fishing license.

This permit expires December 31, 2000.

Poy B. Lingo
Director, Division of Wildlife

C. Joe Bessent
Commissioner, Department of Fish
and Wildlife Resources

cc: Col. Earl Gray
Mark Cramer



APPENDIX D

MEMORANDA OF UNDERSTANDING AMONG ENTITIES COLLABORATING WITH WILDLIFE SERVICES IN THE BDM PROGRAM IN KENTUCKY

MEMORANDUM OF UNDERSTANDING
BETWEEN
UNITED STATES DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION (FAA)
AND
UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
ANIMAL DAMAGE CONTROL (ADC)

ARTICLE 1

This Memorandum of Understanding (MOU) establishes a cooperative relationship between FAA and ADC for resolving animal hazards to aviation that benefits public safety.

ARTICLE 2

This MOU is reached pursuant to the Animal Damage Control Act of March 2, 1931, (7USC 426-426b), and The Rural Development, Agriculture, and Related Agencies Appropriations Act, 1988 (P.L. 100-202), which established the authority of the Secretary of Agriculture to cooperate with States, individuals, public and private agencies, organizations, and institutions in the control of nuisance mammals and birds deemed injurious to the public.

The Administrator of the FAA is empowered to issue airport operating certificates for airports serving air carrier aircraft and certifies that such airports are properly and adequately equipped, and able to conduct safe operations, pursuant to the Federal Aviation Act of 1958, (49USC 1432), as amended. Federal Aviation Regulation (14 CFR Part 139) requires certificated airports having a wildlife hazard problem to develop and implement a wildlife hazard management plan to manage and control wildlife which present a risk to public safety caused by aircraft collisions with wildlife. "Wildlife hazard" has been defined as a potential for a damaging aircraft collision with wildlife, on or near an airport.

ARTICLE 3

FAA and ADC agrees:

- a. That ADC has the expertise to provide technical and operational assistance needed to reduce wildlife hazards to aviation on and near airports.
- b. That most airports lack the technical expertise to identify underlying causes of wildlife hazard problems, but do have the capability to control their own wildlife, following proper instruction in control techniques.

c. That situations arise where nuisance wildlife control is necessary off airport property (roost relocations, reductions in nesting populations, etc.) requiring specialized technical assistance of ADC personnel.

d. That FAA or the certificated airport may request technical and operational assistance from ADC to reduce wildlife hazards. This assistance includes, but is not limited to, site visits to identify wildlife and their movement patterns and habitats which increase the risk of animal and aviation conflicts. ADC personnel may also provide, (1) recommendations on control and habitat management to minimize the hazards, (2) training in the use of control devices, and (3) recommendations on the scope of further studies necessary to identify and minimize wildlife hazards.

e. ADC shall not be liable or responsible for development, approval, or implementation of wildlife hazard management plans required under FAR Part 139.337, this being the responsibility of the airport operator. Information provided by ADC as a result of site visits or consultation shall be used by the airport operator in developing the wildlife hazard management plan.

f. To meet at least annually to review this agreement, identify problems, exchange information on new control methodologies, identify research needs, and prioritize program needs.

ARTICLE 4

All animal damage control activities will be conducted in accordance with applicable Federal, State, and local laws and regulations. ADC personnel shall advise airport operators of their responsibilities to secure necessary permits and/or licenses for control of wildlife.

ARTICLE 5

This MOU defines in general terms, the basis on which the parties will cooperate, and does not constitute a financial obligation to serve as a basis for expenditures. Request for technical, operational, or research assistance which require cooperative or reimbursable funding will be completed under a separate agreement.

ARTICLE 6

This MOU shall supersede all existing MOU's, supplements, and amendments relating to the conduct of animal damage control programs between ADC and FAA.

ARTICLE 7

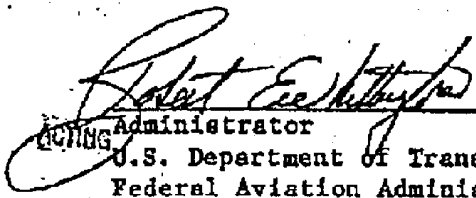
Pursuant to Section 22, Title 41, United States Code, no member of or delegate to Congress shall be admitted to any share or part of this MOU, or to any benefit to arise therefrom.

ARTICLE 8

This MOU shall become effective upon the date of final signature and shall continue indefinitely. This Memorandum may be amended at any time by mutual agreement of the parties in writing. It may be terminated by either party upon 60 days' advance written notice to the other party.

APR 13 1989

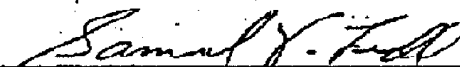
Date



Acting Administrator
U.S. Department of Transportation
Federal Aviation Administration

MAR 21 1989

Date



Acting Administrator
U.S. Department of Agriculture
Animal and Plant Health Inspection Service

MEMORANDUM OF UNDERSTANDING
among
KENTUCKY COOPERATIVE EXTENSION SERVICE
KENTUCKY DEPARTMENT OF AGRICULTURE
CABINET FOR HUMAN RESOURCES, DEPARTMENT OF HEALTH SERVICES
KENTUCKY DEPARTMENT OF FISH AND WILDLIFE RESOURCES
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR NATURAL RESOURCES AND
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

and

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
ANIMAL DAMAGE CONTROL
hereinafter called ADC

ARTICLE 1

The purposes of this Memorandum of Understanding (MOU) are to (1) establish a cooperative relationship among the cooperators and ADC for planning, coordinating, and implementing of animal damage control policies developed to prevent or minimize damage caused by wild animal species, including threatened and endangered species, to agriculture, horticulture, animal husbandry, forestry, wildlife, and human health, safety or other property, and (2) facilitate exchange of information.

ARTICLE 2

Authority exists under the Animal Damage Control Act of March 3, 1931 (7 USC 426-426b) and the Rural Development, Agriculture, and Related Agencies Appropriations Act, 1988 (P.L. 100-202) for ADC to cooperate with States, individuals, public and private agencies, organizations and institutions in the control of wild animals and birds injurious to agriculture, horticulture, forestry, animal husbandry, wildlife, and public health and safety.

ARTICLE 3

The cooperating parties agree to:

A. To meet at least annually in order to discuss mutual animal damage control program concerns, accomplishments, resource needs, available technology, and procedures. ADC will coordinate the annual meeting and any special animal damage control meetings related to the agreement.

B. Upon the mutual agreement of ADC and Kentucky Department of Fish and Wildlife Resources the State Director and his assistants of ADC will be authorized by the Commissioner of the Department to reduce or control wildlife species detrimental to human safety, health, or property under the provisions of K.R.S. 150.105.

C. Requests for Animal Damage Control will be referred by the agency receiving the request to the Kentucky Department of Fish and Wildlife Resources for resident game and furbearer species, or to ADC for all other species. The following are exceptions to the above procedures:

- (a) Problems that can be easily and knowledgeably answered by the receiving agency or individual.
- (b) Blackbird-starling or non-urban commensal rodent problems can be referred directly to ADC or to the Kentucky Department of Agriculture.

ARTICLE 4

All animal damage control activities will be conducted in accordance with the applicable Federal, State, and local laws and regulations.

ARTICLE 5

This MOU defines in general terms the basis on which the parties concerned will cooperate and does not constitute a financial obligation to serve as a basis for expenditures.

ARTICLE 6

Pursuant to Section 22, Title 41, United States Code, no member of or delegate to Congress shall be admitted to any share or part of this MOU or to any benefit to arise therefrom.

ARTICLE 7

This MOU shall become effective upon the date of final signature and shall continue indefinitely. This MOU may be amended at any time by mutual agreement of the parties in writing. It may be terminated by any of the parties upon 60 days' written notice to the other parties.

6/1/88

(Date)

Chas. E. Barnhart
 Director
 Cooperative Extension Service

8/8/88

(Date)

Ward B. Arnold
 Commissioner
 Kentucky Department of Agriculture

8/16/88

(Date)

O. H. Hendry, Jr.
 Commissioner
 Cabinet for Human Resources,
 Department for Health Services

9-7-88

(Date)

Don R. Hulmick
 Commissioner
 Kentucky Department of Fish and
 Wildlife Resources

9-28-88

(Date)

Carl H. Bradley
 Secretary
 Natural Resources & Environmental
 Protection Cabinet

NOV 25 1988

(Date)

Samuel T. Holt
 Acting Administrator
 USDA/Animal and Plant Health
 Inspection Service

APPENDIX E

**MATERIAL SAFETY DATA SHEETS
AND PESTICIDE LABELS FOR
PESTICIDES
USED IN THE KENTUCKY WILDLIFE
SERVICES BDM PROGRAM**

SPECIMEN LABEL

ALPHA-CHORALOSE

Net Contents: 2.04g 99.5% Powder -
INADA 6602 SN

Caution: Contains a new animal drug for use only in investigational animals in clinical trials. Not for use in humans. Edible products of investigational animals are not to be used for food unless authorization has been granted by the U.S. Food and Drug Administration or the U.S. Department of Agriculture. Do not use in birds 30 days prior to or during a legal hunting season in species that are hunted.

USDA/ANIMAL AND PLANT HEALTH
INSPECTION SERVICE

Lot No. _____ Hyattsville, MD 2078212/92

ADC USE OF ALPHA-CHLORALOSE

INTRODUCTION

USDA-APHIS-ADC uses an Integrated Wildlife Damage Management (IWDM) approach to reduce wildlife damage. IWDM, as used by ADC, includes the integration and application of all practical methods of prevention and control to reduce wildlife damage while minimizing harmful effects of control measures on humans, wildlife, and the environment. IWDM may incorporate cultural practices, habitat modification, animal behavior management, local population reduction, or any combination of these approaches depending on the characteristics of a specific damage problem.

With the report of a migratory bird problem, the IWDM approach can be followed by implementing a combination of the most appropriate control technologies. Initially, an applicator should conduct an on-site inspection to determine the most suitable control method available for problem resolution. Implementation of the IWDM approach to resolve a migratory bird damage problem involves objective consideration of several techniques: mechanical scare devices, pyrotechnics, live capture, habitat modifications, and Alpha-Chloralose (A-C).

Before an A-C control program is initiated, time should be taken to evaluate the pros and cons of chemical control. Three basic factors should be

considered when selecting a chemical restraint technique:

1. Will it be safe for the applicator who must handle the animal?
2. Will there be adequate safety for the animal?
3. Can periodic observation and attention be given the animal, following restraint, until it has recovered? (Adapted from Fowler, 1978)

After examination of these basic factors, in relation to a field application of A-C, make the following considerations:

1. Will A-C be the most efficient and cost effective method available to resolve this problem?
2. Does the applicator have the necessary equipment and training to retrieve an immobilized bird from a pond covered with thin ice, or an immobilized pigeon from a frost covered aluminum roof?
3. Will proper facilities be available to house immobilized birds and will sufficient personnel and equipment be available to assure all immobilized birds have the maximum chance of recovery?

GENERAL LIMITATIONS USING CHEMICAL RESTRAINT

The decision whether to use chemical or physical restraint should be based on the skill of the handlers, facilities available, physical and emotional condition of the animal, immediate and surrounding physical circumstances or geography, and the temperature affecting the animal during sedation and recovery.

The person responsible for administering a drug to an animal simultaneously assumes the responsibility for the safety and life of the animal. If this responsibility cannot be accepted, alternative methods should be considered. Obviously, to accept this responsibility, an applicator must have an understanding of the effect of the chemical (adapted from California Department of Fish and Game, 1989).

The following general factors should be considered prior to drug administration:

- 1) purpose and justification,
- 2) type of animal,
- 3) type of terrain or escape cover,
- 4) condition of animal,
- 5) emotional state,
- 6) safety equipment availability,
- 7) temperature affecting the animal,
- 8) time of day,
- 9) physical restraint as an alternative,
- 10) availability of sufficient assistance.

Several of these factors have specific ramifications in an A-C project:

1. Remember birds that have ingested A-C will have 30 to 90 minutes before becoming completely immobilized; determine if these birds will be accessible after being sedated.
2. Determine the condition and weight of the birds.
3. Look for signs of overweight, underweight, or emaciated birds.
4. Determine emotional state--physical and psychological stress result in the liberation of adrenalin and activation of the "fight or flight" response (do not excite or chase a partially chemically restrained animal).
5. Consider ambient temperature--immobilization severely reduces an animal's ability to thermoregulate and avoid superheating (hyperthermia) and double chilling (low ambient temperature and decreased metabolic heat).
6. Remember periodic observation and attention must be provided for the animal, following restraint, until it has recovered, to protect it from injury, suffocation, or drowning.

SPECIFIC LIMITATIONS USING ALPHA-CHLORALOSE

Once the general limitations of chemical restraint have been addressed, consider the following specific limitations of alpha-chloralose.

1. Hunting Season: The current Food and Drug Administration (FDA) label for alpha-chloralose prohibits use 30 days before, or during, the hunting season in free-ranging

waterfowl and coots that might be used for food. This includes potential movement of the birds into a huntable population as well as relocating the birds into a huntable population. This provision was included in the label in order to avoid human ingestion of A-C by eating treated birds taken by hunting. The restriction will also help avoid conflict with the U.S. Fish and Wildlife Service (FWS) regulations governing baiting and live decoys. On a national basis, waterfowl hunting seasons run from September through January. With the 30 day exclusion, A-C use for waterfowl may be greatly restricted for 6 months of the year.

2. Time of Year: Use caution with treatments during the Spring of the year. Copulatory activity when a hen is sedated can easily cause the death of that bird by drowning or suffocation. Young birds may be susceptible to death from overdose or abandonment. Avoid capture operations during the heat of the summer or extreme cold of winter without availability of temperature-controlled holding facilities. Immobilization reduces the ability to thermoregulate. Sedated birds must be kept in atmospherically controlled holding facilities when temperature extremes could induce mortality.

3. Equipment and Facilities: Assure an adequate supply of properly sized cages to transport immobilized birds from the treatment site to the holding facility without producing mortality from overcrowding. Secure an adequate holding facility where food and water can be provided to recovered birds for up to 3 days. Consider the initial costs for equipment and supplies. Although the provisions of the Animal Welfare Act primarily relate to research facilities, consider that this Act was designed to prevent undue mortality and suffering of caged animals. When obtaining cages and holding facilities, incorporate those requirements that will ensure minimum mortality.

4. Personnel: Assure availability of adequate assistance for the duration of the project. Consider using only personnel who have been trained in the use of A-C.

5. Prebaiting: Adequate prebaiting is essential. Sufficient time should have been spent prior to treatment to ensure that the target birds were adequately conditioned to the bait. If prebait acceptance is marginal, partial immobilization or a limited number of bird captures will occur. If possible, get the birds eating out of your hand.
6. Over Water Treatments: Birds should be baited on dry land whenever possible. Waterfowl and mallards in particular have a habit of "chewing" the bread baits before swallowing. During the chewing process, the bread bait will break up and the oil disperses onto the water. Oil dispersion causes the A-C to dissolve in the water instead of being ingested by the target birds.
7. Bird Dispositions: In order to take, relocate, or euthanize migratory birds, approvals and/or permits will be needed from the FWS, state wildlife agencies, local authorities, land management agencies, and/or private landowners. Seek a relocation site of sufficient distance from the capture site to assure the birds will not return. Consider physical alterations to prevent the birds from returning, e.g., clipping flight feathers. Before implementation of euthanasia, consider the method and disposition of carcasses.
8. Record Keeping and Reporting: FDA is highly concerned about "diversion of drugs for unauthorized uses." Impeccable inventory and use and disposal records are required (Accountability). Reports are required for each application as well as an annual summary. Audits (inspections) by FDA may occur at any time at all levels of the ADC program to check records of distribution and use and supplies.

If these limitations to A-C cannot be adequately addressed, alternative capture methods should be considered.

POSITIVE VALUES

A-C, when used properly, can generate some very positive ramifications. Consider the following:

1. Nonlethal Technique: Nonlethal immobilization projects have proven to be a publicly acceptable method of resolving bird problems. According to FDA regulations, A-C can only be used as a live capture agent, not as an avicide.
2. Quick Acting: A serious bird problem can be resolved effectively, efficiently, and quickly.
3. Low Cost: After the initial purchase of equipment and supplies and reduction of the bird population to an acceptable level, annual maintenance costs are minimal.
4. Population Control: A-C allows applicators to capture only the number of birds needed to reduce the problem to an acceptable level. In some areas, such as city parks and housing developments, a small bird population is desired for citizen's enjoyment. A-C allows applicators to maintain a population at any desired level.
5. Personnel: The additional personnel necessary to complete an A-C treatment may lead to a long-term cooperative project with local agencies and increased professional interaction with State wildlife agencies.
6. Public Relations: This nonlethal control technique allows for proactive public relations. An A-C control project can receive positive media coverage if handled properly.

A-C has been used as an immobilizing agent for capturing birds since the early 1960's. The Denver Wildlife Research Center (DWRC) has recently developed appropriate application techniques, demonstrated safety and efficacy to maximize efficient use, and secured authorization for use of the chemical. When used properly, A-C can be an effective and efficient control method for resolving nuisance waterfowl, pigeon, and coot problems.

LAWS

"All ADC employees (Federal and non-Federal) are responsible for conducting official duties in compliance with Federal, State, and local laws and regulations" (USDA-APHIS-ADC Directive 2.210).

FDA and EPA Regulations

The FDA approval allows the drug to be used only for live-capture operations. The Code of Federal Regulations (CFR) Part 21 contains regulations enforced by the Food and Drug Administration (FDA). These regulations govern the use of A-C as an immobilizing agent, but do not permit the use of this drug as an avicide. The deliberate use of A-C as a toxicant for birds would be a violation of FIFRA. If A-C were to be used as an avicide, the drug would then meet the definition of a pesticide and would be governed by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). FIFRA would apply if A-C were to be used as a pesticide to deliberately kill numbers of birds. The disposition of the birds after immobilization and capture does not impact this legal determination.

Migratory Bird Treaty Act

The FWS has the responsibility to enforce the provisions of the Migratory Bird Treaty Act. This law prohibits, among other things, the killing of migratory birds unless permitted by regulations. The unauthorized killing of waterfowl or coots with A-C would be a violation of this Act and subject to civil penalty.

Endangered Species Act

Provisions of the Endangered Species Act (ESA) may apply to control projects in areas where threatened or endangered species are present. Specific pigeon control projects conducted in areas adjacent to peregrine falcon eyries may be restricted. Provisions for control work in these areas may require an endangered species Section 7 Consultation. The Washington ADC Office, Operational Support Staff, will provide guidance regarding such issues.

National Environmental Policy Act

The programmatic EIS has included an analysis of the potential hazards of A-C in the chemical risk assessment. Site-specific project plans should be prepared by the applicator discussing proposed operations and addressing local impacts of the activity. Proper documentation must be provided of the site-specific assessment and public involvement as part of the NEPA compliance. (See 40 CFR 1500, et seq; and 7 CFR 372.)

Depredation Permits - Federal

FWS Regional offices have issued ADC State Directors depredation permits for taking migratory birds. It is the responsibility of the ADC State Director to ensure that their Depredation Permit is valid before taking migratory birds. In most cases, these permits allow the live capture and relocation, along with incidental take, of waterfowl. These permits do not authorize ADC to deliberately kill numbers of waterfowl nor do they define incidental take. ADC State Directors should contact their respective FWS Regional office for clarification of "incidental take" in relation to accidental A-C overdose kills. Additionally, under Title 50, CFR, a permit violation is in itself a chargeable offense and can result in permanent permit revocation.

Depredation Permits - State

ADC State Directors should contact their respective State wildlife management agency for clarification of regulations governing taking and relocating migratory birds.

Authorization To Use - State

ADC State Directors should contact their State agency responsible for drugs or pharmaceuticals for clarification or regulations governing authorization to use A-C in their respective State.

REFERENCES

California Department of Fish and Game. 1989. Wildlife restraint handbook.

Fowler, M. E. 1978. Restraint and handling of wild and domestic animals. Iowa State University Press. 332p.

Woronecki, P. P., R. A. Dolbeer, and T. W. Seamans. 1990. Use of Alpha-chloralose to remove waterfowl from nuisance and damage situations. Proc. Vertebr. Pest Conf. 14:343-349.

Woronecki, P. P., R. A. Dolbeer, T. W. Seamans, and W. R. Lance. 1992. Status of FDA registration of alpha-chloralose to capture nuisance waterfowl and pigeons. Proc. Vertebr. Pest Conf. 15:72-78.

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072



IDENTITY (As Used on Label and List) alpha-CHLORALOSE		Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.	
Section I (C ₈ H ₁₁ Cl ₃ O ₆)		(CAS RN: 15879-93-3)	
Manufacturer's Name BIOSYNTH AG		Emergency Telephone Number From USA 01141 71 430190	
Address (Number, Street, City, State, and ZIP Code) P.O.Box 125		Telephone Number for Information From Switzerland 071 430190	
CH - 9422 Staad (SG)		Date Prepared April 20, 1990	
SWITZERLAND		Signature of Preparer (optional)	

[illegible]

Boiling Point	unknown	Specific Gravity ($H_2O = 1$)	unknown
Vapor Pressure (mm Hg.)	unknown	Melting Point	ca. $180^{\circ}C$
Vapor Density (AIR = 1)	unknown	Evaporation Rate (Butyl Acetate = 1)	unknown
Solubility in Water	one gram dissolves in 225 ml water at $15^{\circ}C$, in 120 ml at $37^{\circ}C$		
Appearance and Odor	white powder; no characteristic odor		

Flash Point (Method Used)	unknown	Flammable Limits	unknown	LEL	UEL
Extinguishing Media	water, carbon dioxide, dry chemical powder				
Special Fire Fighting Procedures	full respiratory protection is needed when dealing with fires				

when heated to decomposition it emits toxic fumes of chlorides

Section V — Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable	X	

Incompatibility (Materials to Avoid)

strong oxidizing agents, strong acids

Hazardous Decomposition or Byproducts

carbon oxides, chlorides

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	

Section VI — Health Hazard Data

Route(s) of Entry:	Inhalation?	yes	Skin?	probable	Ingestion?	yes
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Health Hazards (Acute and Chronic)

-harmful by inhalation and if swallowed

-is reported to be highly toxic; tumorigenic data and toxicity data see RTECS# FM9450000 (ipr-mus LD50:190 mg/kg) and SAX 6,1476. (THR: An exper. ETA.HIGH ipr,or!.. Reported in EPA TSCA Inventory, 1980)

Carcinogenicity:	NTP?	IARC Monographs?	OSHA Regulated?
unknown			

Signs and Symptoms of Exposure

unknown

Medical Conditions

Generally Aggravated by Exposure

consult a physician immediately

Emergency and First Aid Procedures

external: flush with water, wash with soap

internal: wash out the mouth, induce vomiting, if inhaled remove to fresh air

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled

cover and sweep-up with inert carrier, remove to certified landfill site

Waste Disposal Method

dissolve in a comustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber

Precautions to Be Taken in Handling and Storing

Storing: storable at room temperature

Handling: avoid contact with skin & eyes and inhalation of dust

Other Precautions

keep away from sources of ignition - no smoking

Section VIII — Control Measures

Respiratory Protection (Specify Type) filter mask

Ventilation	Local Exhaust	yes	Special	none
	Mechanical (General)	yes	Other	none

Protective Gloves rubber or vinyl Eye Protection goggles or face shield

Other Protective Clothing or Equipment lab apron or equivalent

Work/Hygiene Practices wash the skin after handling

Merck Index 11, 2062

RTECS# FM9450000

Sax 6, 1476

MATERIAL SAFETY DATA SHEET

Manufacturer's/Preparer's Name-----Avitrol Corporation
7644 East 46th Street
Tulsa, Oklahoma 74145

Emergency/Regular Telephone Number-918-622-7763
In case of poisoning call Poison Control Center 800-522-4611

Date Prepared: July 10, 1996 --- MSDS #: 11649-A REV 7

PRODUCT NAMES (as shown on label):

Avitrol Wheat-	EPA Reg. No. 11649-1,
Avitrol Sorghum-	EPA Reg. No. 11649-3,
Avitrol Mixed Grains-	EPA Reg. No. 11649-4,
Avitrol Corn Chops-	EPA Reg. No. 11649-6, OR
Avitrol Whole Corn-	EPA Reg. No. 11649-7

=====

SECTION I. Product Information

Active Ingredient-----4-aminopyridine-CL
Synonyms -----4-AP
Chemical Family-----Pyridines
Formula-----C₅H₆N₂-CL

These products are formulations of 0.5% 4-aminopyridine hydrochloride impregnated grains. The 99.5% inerts consist of one of the above grains. These products contain no Volatile Organic Compounds.

SECTION II- Physical/Chemical Characteristics

Appearance -----Grain
Odor -----None
Boiling point -----Not applicable
Vapor pressure(mm Hg.) -----Not applicable
Vapor density(air=1) -----Not applicable
Specific Gravity(H₂O=1) -----Not applicable
Melting Point -----Not applicable
Evaporation Rate (Butyl Acetate =1)----Not applicable
pH -----Not applicable
% Volatiles -----Not applicable
Solubility in H₂O -----Insoluble

SECTION III - Hazardous Ingredients' Non-Hazardous Ingredients"

<u>Ingredient Name</u>	<u>CAS #</u>	<u>OSHA-PEL</u>	<u>ACGIH-TLV</u>	<u>OTHER</u>	<u>%</u>
4-Aminopyridine-CL'	001003403	NONE	NONE	NONE	0.5
Impregnated Grain"	NONE	NONE	NONE	NONE	99.5

SECTION IV - Fire and Explosion Hazard

Flash Point:-----Not applicable
 Flammable Limits: -----UFL and LFL Not applicable
 Extinguishing Media:-----Dry Chemical, CO₂, Foam, water.
 Degree of Fire/Explosion Hazard:---No known fire or explosion hazard.
 However, grains will burn at higher temperatures.
 Special Fire Fighting Procedures:---Do not breathe smoke or vapors;
 isolate fire; wear full protective clothing and self-contained breathing apparatus.
 Stability:-----Stable
 Hazardous Polymerization:-----Will not occur
 Incompability/Conditions to Avoid:---Water, heat, fire, chemicals.
 Burning may produce toxic by-products.
 Hazardous Decomposition Products:---Burning may produce any number of
 toxic products including but not limited to carbon dioxide, carbon monoxide, chlorine and hydrogen chloride.

SECTION V - Health Hazard Data

Primary routes of Entry:----- Acute effects from overexposure may result from ingestion.
 Acute Effects of Overexposure:---- There is no human specific data available. The acute toxicity of these products, as packaged, ranges from an LD-50 of about 700 mg/kg for some avian species to an LD-50 of about 6500 mg/kg for white rats. Laboratory animals when administered toxic doses of the formulation exhibited evidence of nervous system effects such as loss of motor control, uncoordination, anxiety, tremors, and involuntary convulsions followed by death.

Chronic Effects From Overexposure-- There are no known chronic effects of overexposure to these products. However, persons handling large quantities of these products who are allergic to grain and grain dust should anticipate similar allergic reactions.

Medical Conditions Aggravated by Exposure-- Other than grain allergies, none presently known.

Carcinogenicity: NTP: No IRAC: No OSHA: No

SECTION VI - Emergency and First Aid Procedures

Eyes:----- Avoid contact with eyes. If in eyes, flush with plenty of water. Get medical attention if irritation persists.

Skin:----- Wash thoroughly with soap and water after handling.

Inhalation:----- Not applicable.

Ingestion:----- If one of these products is swallowed: If patient is Unconscious- maintain breathing and heart beat (CPR: Cardiopulmonary resusitation). Contact your local Poison Control Center, hospital or physician immediately. If the patient is conscious:- Induce vomiting with syrup of Ipecac (if not available, stimulate the back of the throat with finger). Never give anything by mouth to an unconscious person. Contact your Poison Control Center, hospital or physician immediately.

SECTION VII - Employee Protective Requirements

Ventilation:----- Accumulation of grain dust can result in explosive mixtures. When handling and/or blending these products with untreated grains provide ventilation to prevent accumulation of dust.

Work Clothing:----- Avoid contact with clothing. Although not required by the label, wearing a long sleeved uniform, coveralls or lab jacket is suggested when handling or blending these products with untreated grains.

Eye and Respiratory Protection:----- Because of grain dust allergies, persons handling these products may consider wearing chemical protective goggles and a NIOSH/MSHA approved dust and mist respirator.

Gloves ----- Because of grain dust allergies, persons handling these products may consider wearing chemical protective gloves, surgical gloves or regularly washed cotton gloves.

SECTION VIII - Storage, Spill, and Waste Disposal Procedures

Storage Instructions:----- Keep out of reach of children and animals. Do not contaminate water, food or feed by storage or disposal. Store in original container only. Store apart from food or animal feed and protect against rodent penetration of the carton. Store apart from other pesticides, fertilizers, food or feed that may cause cross- contamination of odor or insect infestation.

Handling Instructions:----- Wash exposed body areas before eating, drinking, smoking and before going to other intermediate tasks during the workday. Shower at the end of each workday.

Spill or Leak:----- Isolate and post spill area. Wear prescribed protective clothing and equipment. Keep unprotected persons and animals out of the spill area. Keep material out of lakes, streams and sewers. If unadulterated, product may be packaged in original container for use. If adulterated, shovel waste into an approved drum. Sweep area thoroughly and wipe down with wet cloth or towels.

Disposal instructions:----- Because acceptable methods of disposal may vary by location, and because regulatory requirements may change, the appropriate regulatory agencies should be contacted prior to disposal of adulterated product, sweepings and wipe down clothes.

SECTION IX - Shipping Description

DOT-- Not regulated. UN--Not regulated.

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS & DOMESTIC ANIMALS

DANGER: Poisonous if swallowed. Harmful if absorbed through skin. May cause eye irritation. Do not breathe dust. Do not get in eyes, on skin, or on clothing.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to birds and fish. Wildlife feeding on treated bait may be killed. Do not contaminate water by cleaning equipment or disposal of waste. Do not feed to livestock or poultry feed. Do not mix with grain for livestock or poultry feed. Pick up and dispose of dead birds by burial.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

USE RESTRICTIONS

Do not use where food (grain or meal) might become contaminated.

Avitrol must not be exposed in any manner that may endanger desirable and protected bird species. If there is a question of such hazard, consult local, state and federal game authorities before undertaking bird management with Avitrol.

Investigate local laws that may prohibit the use of any toxic chemical in bird control.

Applicators must wear protective clothing, including long sleeves, gloves and respirators when using this product.

STORAGE & DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

1. STORAGE INSTRUCTIONS:

Store in original container only. Store apart from food or animal feed and protect against rodent penetration of the carton. Store apart from other pesticides, fertilizers, food or feed that may cause cross-contamination of odor or insect infestation.

2. DISPOSAL INSTRUCTIONS:

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance. Completely empty liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment. Then dispose of liner in a sanitary landfill or by incineration if allowed by State and Local authorities. If drum is contaminated and cannot be reused, dispose of in the same manner.

RESTRICTED USE PESTICIDE

For sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's Certification.

Avitrol

CONCENTRATE

Active Ingredient: 4-Aminopyridine 25.0%
Inert Ingredients: 75.0%

Total 100.0%

Avitrol is a poison with flock alarming properties used for the control of Gulls at, in, near or in the vicinity of Sanitary Landfills, Airports and structures where Gulls feed, nest, loaf or roost. In such a way that a part of a flock may read and frighten the rest away. Birds that read and alarm a flock usually die.

Herring Gulls (*Larus argentatus*), as are all Gulls, are protected by law and treaty. Both Federal and State permits are required to use the Avitrol method of Gull control.

Avitrol Lot No.

KEEP OUT OF REACH OF CHILDREN DANGER POISON

STATEMENT OF PRACTICAL TREATMENT

If swallowed: If the patient is unconscious, maintain breathing and heart beat (CPR: Cardiopulmonary resuscitation). Contact your local Poison Control Center, hospital or physician immediately.

If patient is conscious: Induce vomiting with syrup of Ipecac (if not available, stimulate the back of the throat with finger). Never give anything by mouth to an unconscious person. Contact your Poison Control Center, hospital or physician immediately.

If in eyes: Flush with plenty of water. Get medical attention if irritation persists.

If on skin: Wash thoroughly with soap and water.

See side panel for additional precautionary statements.

Manufactured By
AVITROL CORPORATION
7644 East 46th Street
Tulsa, Oklahoma 74145
(918) 622-7763 • (800) 633-5069
EPA Reg. No. 11849-10
EPA Est. 11649-OK-1
Net Contents 0.283 oz. (8 grams)

PREBATING DIRECTIONS

This product must not be applied where nontarget birds are feeding. Careful observations of the bird feeding habits must therefore be made to establish proper feeding locations and to determine that nontarget birds are feeding on the prebait.

Prebaiting with bread is essential to the effective deterrence of birds with Avitrol. Tossing bread squares into the air sometimes attracts the bird. Bread tossed from a very slowly moving vehicle is often readily accepted. Bait can also be effectively broadcast by a person on foot. In this case it is desirable to wear the same hat and clothing each time. Immediately after the bait is applied, move away from the area. Early morning placement, before natural feeding occurs, is best. Continue prebaiting until the past birds have established the feeding pattern.

BAIT PREPARATION

To prepare the bait, cut each of two (2) slender slices of fresh bread into 12 equal pieces. Open and place into the plastic bag in which a portion of the product purchased was shipped; close by twisting the top entrapping as much air as possible. Thoroughly mix and shake the contents until all the powder is evenly distributed over the pieces of bread with none remaining on the walls of the bag. Hand treated bait with a gloved hand and remove with soap and water any of the powder that may have adhered to the skin.

DILUTION DIRECTIONS

Prior to baiting, mix one part (24 squares) bread treated with Avitrol Concentrate with 10 additional parts (240 squares) of untreated bread of similar size. Use rubber glove if mixing is done by hand.

BAITING DIRECTIONS

To obtain minimal mortality, the distribution of Avitrol should be limited to scattered spot placements. It will provide feeding opportunities only for the necessary number of target birds. After the birds' feeding pattern has been established through prebaiting, replace untreated bait with diluted treated bait on sites where the target birds are actively feeding. Do not apply treated bait to inactive feeding sites. Where untreated bait may be a hazard to other birds or animals, it should be picked up at the end of each day. Do not allow Avitrol treated bread to remain in unprotected places where it may be mistaken for food by people or animals. This product must not be applied where nontarget bird species are feeding. For each application of bait in flocks over 5,000, broadcast the 264 bread squares (2 treated and 240 untreated) prepared from one lb. of powder among eight widely separated sites. If flocks fewer than 5,000, use half of the above quantity. Repeat treatment until bird numbers have been reduced to acceptable levels on the premises. No retreatment may also be necessary after rainfall.

Notice: Buyer and/or user assumes all risks of use and/or handling of these materials contrary to label instructions.

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS & DOMESTIC ANIMALS

CAUTION: Harmful if swallowed. May cause irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to birds and fish. Wildlife feeding on treated bait may be killed. Do not contaminate water by cleaning equipment or disposal of waste. Do not feed to livestock or poultry. Do not mix with grain for livestock or poultry feed.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

USE RESTRICTIONS

Do not use where food (grain or meat) might become contaminated.

Avitrol must not be exposed in any manner that may endanger desirable and protected bird species. If there is a question of such hazard, consult local, state and federal game authorities before undertaking bird management with Avitrol.

Investigate local laws that may prohibit the use of any toxic chemical in bird control.

STORAGE & DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

1. STORAGE INSTRUCTIONS:

Store in original container only. Store apart from food or animal feed and protect against rodent penetration of the carton. Store apart from other pesticides, fertilizers, food or feed that may cause cross-contamination of odor or insect infestation.

2. DISPOSAL INSTRUCTIONS:

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance. Completely empty liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment. Then dispose of liner in a sanitary landfill or by incineration if allowed by State and Local authorities. If drum is contaminated and cannot be reused, dispose of in the same manner.

RESTRICTED USE PESTICIDE

For sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's Certification.

AVITROL

WHOLE CORN

Active Ingredient: 4-Aminopyridine	0.5%
Inert Ingredients:	99.5%
Total	100.0%

Avitrol is a poison with flock alarming properties used for the control of Feral Pigeons in, on or in the area of structures, feeding, nesting, loafing and roosting sites, in such a way that a part of a flock may react and frighten the rest away. Birds that react and alarm a flock usually die.

KEEP OUT OF REACH OF CHILDREN CAUTION STATEMENT OF PRACTICAL TREATMENT

If swallowed: If the patient is unconscious, maintain breathing and heart beat (CPR: Cardiopulmonary resuscitation). Contact your local Poison Control Center, hospital or physician immediately.

If patient is conscious: Induce vomiting with syrup of Ipecac (if not available, stimulate the back of the throat with finger). Never give anything by mouth to an unconscious person. Contact your Poison Control Center, hospital or physician immediately.

If in eyes: Flush with plenty of water. Get medical attention if irritation persists.

See side panel for additional precautionary statements.

Manufactured By
AVITROL CORPORATION
7644 East 46th Street
Tulsa, Oklahoma 74145
(818) 622-7763 • (800) 633-5069
EPA Reg. No. 11649-7
EPA Est. 11649-OK-1

Avitrol Lot No. _____

Net Contents: _____ Pounds

PREBAITING DIRECTIONS

This product must not be applied where nontarget birds are feeding. Careful observations of the bird feeding habits must therefore be made to establish proper feeding locations and to determine that nontarget birds are feeding on the prebait. Prebaiting with untreated grains of the same composition as the Avitrol carrier is usually essential to the effective deterrence of birds with Avitrol. The exact prebaiting technique employed will vary depending on the birds' location and the surrounding environment. The locale should be studied for a period long enough to ascertain the birds' habits in the area. Proper prebaiting and treatment with diluted Avitrol grain will minimize the chance of bird mortality while producing the optimum conditions for the desired results. Pigeons will feed from roof tops as well from the ground. Feed acceptance from trays normally require more time.

DILUTION DIRECTIONS

Avitrol treated grain should be thoroughly mixed with untreated grain of the same composition. The Avitrol carrier at the dilution ratios indicated below. For the control of Pigeons with Avitrol, dilution ratio of one part treated to twenty-nine parts untreated can be used in most situations. However, where other bird food is available, this ratio may need to be adjusted to a one part treated to nine or fourteen parts untreated, or even lower. No dilution ratio less than one part treated to nine parts untreated is recommended.

BAITING DIRECTIONS

To obtain minimal mortality, the distribution of Avitrol should be limited to scattered spot placements. It will provide feeding opportunities only for the necessary number of target birds. After the birds' feeding pattern has been established through prebaiting, replace untreated bait with diluted treated bait at sites where the target birds are actively feeding. Do not apply treated bait to inactive feeding sites. Where uneaten bait may be a hazard to other birds or animals, it should be picked up at the end of each day. This product must not be applied where nontarget bird species are feeding. During the few days, baiting with Avitrol may require successive applications until control is obtained. Note if retreatment may also be necessary after rain.

Notice: Buyer and/or user assumes all risks of use and/or handling of these materials contrary to the instructions.

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS & DOMESTIC ANIMALS

CAUTION: Harmful if swallowed. May cause irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to birds and fish. Wildlife feeding on treated bait may be killed. Do not contaminate water by cleaning equipment or disposal of waste. Do not feed to livestock or poultry. Do not mix with grain for livestock or poultry feed.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

USE RESTRICTIONS

Do not use where food (grain or meat) might become contaminated.

Avitrol must not be exposed in any manner that may endanger desirable and protected bird species. If there is a question of such hazard, consult local, state and federal game authorities before undertaking bird management with Avitrol.

Investigate local laws that may prohibit the use of any toxic chemical in bird control.

STORAGE & DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

1. STORAGE INSTRUCTIONS:

Store in original container only. Store apart from food or animal feed and protect against rodent penetration of the carton. Store apart from other pesticides, fertilizers, food or feed that may cause cross-contamination of odor or insect infestation.

2. DISPOSAL INSTRUCTIONS:

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinseate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance. Completely empty liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment. Then dispose of liner in a sanitary landfill or by incineration if allowed by State and Local authorities. If drum is contaminated and cannot be reused, dispose of in the same manner.

RESTRICTED USE PESTICIDE

For sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's Certification.



DOUBLE STRENGTH WHOLE CORN

Active Ingredient: 4-Aminopyridine

Inert Ingredients:

Total

1.0%

99.0%

100.0%

Avitrol is a poison with flock alarming properties used for the control of Crows in, on or in the area of structures, feeding, nesting and roosting sites, in such a way that a part of a flock may react and frighten the rest away. Birds that react and alarm a flock usually die.

KEEP OUT OF REACH OF CHILDREN CAUTION STATEMENT OF PRACTICAL TREATMENT

If swallowed: If the patient is unconscious, maintain breathing and heart beat (CPR: Cardiopulmonary resuscitation). Contact your local Poison Control Center, hospital or physician immediately.

If patient is conscious: Induce vomiting with syrup of Ipecac (if not available, stimulate the back of the throat with finger). Never give anything by mouth to an unconscious person. Contact your Poison Control Center, hospital or physician immediately.

If in eyes: Flush with plenty of water. Get medical attention if irritation persists.

See side panel for additional precautionary statements.

Manufactured By
AVITROL CORPORATION
7644 East 46th Street
Tulsa, Oklahoma 74145
(918) 622-7763 • (800) 633-5069
EPA Reg. No. 11649-8
EPA Est. 11649-OK-1

Avitrol Lot No.

Net Contents:

Pounds

PREBATING DIRECTIONS

This product must not be applied where non-target birds are feeding. Careful observations of the feeding habits must therefore be made to establish proper feeding locations and to determine if non-target birds are feeding on the prebait. Prebaiting with untreated grains of the same composition as the Avitrol carrier is usually essential to the effective deterrence of birds with Avitrol.

DILUTION DIRECTIONS

Avitrol treated grain should be thoroughly mixed with untreated grain of the same composition as the Avitrol carrier at the dilution ratios indicated below. For the control of Crows with Avitrol, a dilution ratio less than one part treated to nine parts untreated grain is recommended.

BAITING DIRECTIONS

To obtain minimal mortality, the distribution of bait should be limited to scattered spot placement which will provide feeding opportunities only for the necessary number of target birds. After the birds' feeding pattern has been established through prebaiting, replace untreated bait with diluted treated bait at sites where the target birds are actively feeding. Do not apply treated bait to inactive feeding. Where uneaten bait may be a hazard to other birds or animals, it should be picked up at the end of each day. This product must not be applied where non-target bird species are feeding. During the few days, baiting with Avitrol may require successive applications until control is obtained. No retreatment may also be necessary after rain.

Notice: Buyer and/or user assumes all risks of loss and/or handling of these materials contrary to instructions.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS & DOMESTIC ANIMALS

CAUTION: Harmful if swallowed. May cause irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to birds and fish. Wildlife feeding on treated bait may be killed. Do not contaminate water by cleaning equipment or disposal of waste. Do not feed to livestock or poultry. Do not mix with grain for livestock or poultry feed.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

USE RESTRICTIONS

Do not use where food (grain or meat) might become contaminated.

Avitrol must not be exposed in any manner that may endanger desirable and protected bird species. If there is a question of such hazard, consult local, state and federal game authorities before undertaking bird management with Avitrol.

Investigate local laws that may prohibit the use of any toxic chemical in bird control.

STORAGE & DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

1. STORAGE INSTRUCTIONS:

Store in original container only. Store apart from food or animal feed and protect against rodent penetration of the carton. Store apart from other pesticides, fertilizers, food or feed that may cause cross-contamination of odor or insect infestation.

2. DISPOSAL INSTRUCTIONS:

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance. Completely empty liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment. Then dispose of liner in a sanitary landfill or by incineration if allowed by State and local authorities. If drum is contaminated and cannot be reused, dispose of in the same manner.

RESTRICTED USE PESTICIDE

For sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's Certification.



CORN CHOPS

Active Ingredient: 4-Aminopyridine
Inert Ingredients:

Total

0.5%
99.5%
100.0%

Avitrol is a poison with flock alarming properties used for the control of House Sparrows, Red-Winged, Yellow-Headed, Rusty and Brewers Blackbirds, Grackles, Starlings and Cowbirds in, on or in the area of structures, feeding, nesting and roosting sites, in such a way that a part of a flock may react and frighten the rest away. Birds that react and alarm a flock usually die.

KEEP OUT OF REACH OF CHILDREN

CAUTION

STATEMENT OF PRACTICAL TREATMENT

If swallowed: If the patient is unconscious, maintain breathing and heart beat (CPR: Cardiopulmonary resuscitation). Contact your local Poison Control Center, hospital or physician immediately.

If patient is conscious: Induce vomiting with syrup of Ipecac (if not available, stimulate the back of the throat with finger). Never give anything by mouth to an unconscious person. Contact your Poison Control Center, hospital or physician immediately.

If in eyes: Flush with plenty of water. Get medical attention if irritation persists.

See side panel for additional precautionary statements.

Manufactured By
AVITROL CORPORATION

7644 East 46th Street
Tulsa, Oklahoma 74145
(918) 622-7763 • (800) 633-5059
EPA Reg. No. 11649-B
EPA Est. 11649-OK

Avitrol is a registered trademark of Avitrol Corporation.

Not Contents

Residue

PREBAITING DIRECTIONS

This product must not be applied where nontarget birds are feeding. Careful observations of the birds' feeding habits must therefore be made to establish proper feeding locations and to determine that no nontarget birds are feeding on the prebait. Prebaiting with untreated grain of the same composition as the Avitrol carrier is usually essential to the effective deterrence of birds with Avitrol. The target species are primarily ground feeders and should be prebaited on the ground when possible. Inside structures, prebaiting may be performed on elevated flat surfaces, perching areas and ledges. Bait trays may be used but feeding acceptance will normally require more time.

DILUTION DIRECTIONS

Avitrol treated grain should be thoroughly mixed with untreated grain of the same composition as the Avitrol carrier at the dilution ratios indicated below. For the control of Blackbirds, Grackles, Starlings and Cowbirds with Avitrol, no dilution ratio less than one part treated to nine parts untreated is recommended. House Sparrows, however, usually operate within limited areas, with feeding and nesting sites relatively close to one another. Thus, while ratios of one part treated to nine (or more) untreated parts have given good control in many instances, particularly stubborn cases may require a ratio of one part treated to five parts untreated. Greater numbers of birds may be killed, however, as toxic bait is made less dilute.

BAITING DIRECTIONS

To obtain minimal mortality, the distribution of Avitrol should be limited to scattered spot placements that will provide feeding opportunities only for the necessary number of target birds. After the birds' feeding pattern has been established through prebaiting, replace untreated bait with diluted treated bait only at sites where the target birds are actively feeding. Do not apply treated bait to inactive feeding sites. Where untreated bait may be a hazard to other birds or animals, it should be picked up at the end of each day. This product must not be applied where nontarget bird species are feeding. During the first few days, baiting with Avitrol may require successive applications until control is obtained. Note that retreatment may also be necessary after rainfall.

Notice: Buyer and/or user assumes all risks of use and/or handling of these materials contrary to label instructions.

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS & DOMESTIC ANIMALS

CAUTION: Harmful if swallowed. May cause irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to birds and fish. Wildlife feeding on treated bait may be killed. Do not contaminate water by cleaning equipment or disposal of waste. Do not feed to livestock or poultry. Do not mix with grain for livestock or poultry feed.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

USE RESTRICTIONS

Do not use where food (grain or meat) might become contaminated.

Avitrol must not be exposed in any manner that may endanger desirable and protected bird species. If there is a question of such hazard, consult local, state and federal game authorities before undertaking bird management with Avitrol.

Investigate local laws that may prohibit the use of any toxic chemical in bird control.

STORAGE & DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

1. STORAGE INSTRUCTIONS:

Store in original container only. Store apart from food or animal feed and protect against rodent penetration of the carton. Store apart from other pesticides, fertilizers, food or feed that may cause cross-contamination of odor or insect infestation.

2. DISPOSAL INSTRUCTIONS:

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance. Completely empty liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment. Then dispose of liner in a sanitary landfill or by incineration if allowed by State and Local authorities. If drum is contaminated and cannot be reused, dispose of in the same manner.

RESTRICTED USE PESTICIDE

For sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's Certification.

Avitrol

DOUBLE STRENGTH CORN CHOPS

Active Ingredient: 4-Aminopyridine

Inert Ingredients:

Total

1.0%

99.0%

100.0%

Avitrol is a poison with flock alarming properties used for the control of Red-Winged, Yellow-Headed, Rusty and Brewers Blackbirds, Grackles, Cowbirds and Starlings in, on or in the area of feedlots, structures, nesting, roosting and feeding sites, in such a way that a part of the flock may react and frighten the rest away. Birds that react and alarm a flock usually die.

KEEP OUT OF REACH OF CHILDREN

CAUTION

STATEMENT OF PRACTICAL TREATMENT

If swallowed: If the patient is unconscious, maintain breathing and heart beat (CPR: Cardiopulmonary resuscitation). Contact your local Poison Control Center, hospital or physician immediately.

If patient is conscious: Induce vomiting with syrup of ipecac (if not available, stimulate the back of the throat with finger). Never give anything by mouth to an unconscious person. Contact your Poison Control Center, hospital or physician immediately.

If in eyes: Flush with plenty of water. Get medical attention if irritation persists.

See side panel for additional precautionary statements.

Manufactured By
AVITROL CORPORATION
7644 East 46th Street
Tulsa, Oklahoma 74145
(918) 822-7763 • (800) 633-5069
EPA Reg. No. 11649-5
EPA Est. 11649-OK-1

Avitrol Lot No.

Net Contents:

Pounds

PREBAITING DIRECTIONS

This product must not be applied where nontarget birds are feeding. Careful observations of the bird feeding habits must therefore be made to establish proper feeding locations and to determine that nontarget birds are feeding on the prebait. Prebaiting with untreated grains of the same composition as the Avitrol carrier is usually essential to the effective deterrence of birds with Avitrol. The target species are primarily ground feeders and should be placed at ground level if possible.

For the control of Starlings in feedlots, corn may be rendered more attractive by mixing it with one part of peanut butter. This mix must be kept off the ground, out of reach of cattle.

DILUTION DIRECTIONS

Avitrol treated grain should be thoroughly mixed with untreated grain of the same composition as the Avitrol carrier at the dilution ratios indicated below. For the control of Blackbirds, Cowbirds, Grackles and Starlings with Avitrol, no dilution is less than one part treated to nine parts untreated is recommended.

BAITING DIRECTIONS

To obtain minimal mortality, the distribution of Avitrol should be limited to scattered spot placements that will provide feeding opportunities only for the necessary number of target birds. After the birds' feeding pattern has been established through prebaiting, replace untreated bait with diluted treated bait or at sites where the target birds are actively feeding. Do not apply treated bait to inactive feeding sites. Where uneaten bait may be a hazard to other birds or animals, it should be picked up at the end of each day. This product must not be applied where nontarget bird species are feeding.

Bait mixed with peanut butter must be kept off the ground, out of reach of cattle.

During the first few days, baiting with Avitrol may require successive applications until control is obtained. Note that retreatment may also be necessary after rainfall.

Notice: Buyer and/or user assumes all risks of loss and/or handling of these materials contrary to the instructions.

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS & DOMESTIC ANIMALS

CAUTION: Harmful if swallowed. May cause irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to birds and fish. Wildlife feeding on treated bait may be killed. Do not contaminate water by cleaning equipment or disposal of waste. Do not feed to livestock or poultry. Do not mix with grain for livestock or poultry feed.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

USE RESTRICTIONS

Do not use where food (grain or meat) might become contaminated.

Avitrol must not be exposed in any manner that may endanger desirable and protected bird species. If there is a question of such hazard, consult local, state and federal game authorities before undertaking bird management with Avitrol.

Investigate local laws that may prohibit the use of any toxic chemical in bird control.

STORAGE & DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

1. STORAGE INSTRUCTIONS:

Store in original container only. Store apart from food or animal feed and protect against rodent penetration of the carton. Store apart from other pesticides, fertilizers, food or feed that may cause cross-contamination of odor or insect infestation.

2. DISPOSAL INSTRUCTIONS:

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance. Completely empty liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment. Then dispose of liner in a sanitary landfill or by incineration if allowed by State and local authorities. If drum is contaminated and cannot be reused, dispose of in the same manner.

RESTRICTED USE PESTICIDE

For sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's Certification.



MIXED GRAINS

Active Ingredient: 4-Aminopyridine

Inert Ingredients:

Total

0.5%

99.5%

100.0%

Avitrol is a poison with flock alarming properties used for the control of Pigeons, House Sparrows, Red-Winged, Yellow-Headed, Brewers and Rusty Blackbirds, Grackles, Cowbirds and Starlings in, on or in the area of structures, nesting, feeding, loafing and roosting sites, in such a way that a part of a flock may react and frighten the rest away. Birds that react and alarm a flock usually die.

PREBAITING DIRECTIONS

This product must not be applied where nontarget birds are feeding. Careful observations of the bird feeding habits must therefore be made to establish proper feeding locations and to determine that nontarget birds are feeding on the prebait. Prebaiting with untreated grains of the same composition as the Avitrol carrier is usually essential to the effective deterrence of birds with Avitrol. The target species are primarily ground feeders and should be prebaited on the ground when possible. Pigeons will feed from roof tops as well as from the ground inside structures, prebaiting may be performed on elevated flat surfaces, perching and loafing areas and ledges. Bait trays may be used but feed acceptance will normally require more time.

DILUTION DIRECTIONS

Avitrol treated grains should be thoroughly mixed with untreated grains of the same composition. The Avitrol carrier at the dilution ratios indicated below. For the control of Pigeons, Blackbirds, Grackles, Starlings and Cowbirds with Avitrol, dilution ratio less than one part treated to nine parts untreated is recommended. House Sparrows, however, usually operate within limited areas, with feeding and nesting sites relatively close to one another. Thus, while ratios of one part treated to nine parts untreated have given good control many instances, particularly stubborn cases may require a ratio of one part treated to five parts untreated. Greater numbers of birds may be killed, however, as toxic bait is made less dilute.

KEEP OUT OF REACH OF CHILDREN

CAUTION

STATEMENT OF PRACTICAL TREATMENT

If swallowed: If the patient is unconscious, maintain breathing and heart beat (CPR: Cardiopulmonary resuscitation). Contact your local Poison Control Center, hospital or physician immediately.

If patient is conscious: Induce vomiting with syrup of Ipecac (if not available, stimulate the back of the throat with finger). Never give anything by mouth to an unconscious person. Contact your Poison Control Center, hospital or physician immediately.

If in eyes: Flush with plenty of water. Get medical attention if irritation persists.

See side panel for additional precautionary statements.

Manufactured By
AVITROL CORPORATION
7644 East 46th Street
Tulsa, Oklahoma 74145
(918) 622-7763 • (800) 633-5069
EPA Reg. No. 11649-4
EPA Est. 11649-OK-1

Avitrol Lot No.

Net Contents:

Pounds

BAITING DIRECTIONS

To obtain minimal mortality, the distribution of Avitrol should be limited to scattered spot placements it will provide feeding opportunities only for the necessary number of target birds. After the birds' feeding pattern has been established through prebaiting replace untreated bait with diluted treated bait or at sites where the target birds are actively feeding. Do not apply treated bait to inactive feeding site. Where untreated bait may be a hazard to other birds or animals, it should be picked up at the end of each day. This product must not be applied where nontarget bird species are feeding. During the first few days, baiting with Avitrol may require successive applications until control is obtained. Note if retreatment may also be necessary after rainfall.

Notice: Buyer and/or user assumes all risks of loss and/or handling of these materials contrary to its instructions.

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS & DOMESTIC ANIMALS

DANGER: Poisonous if swallowed. May be fatal if inhaled. Do not breathe dust. Wear a mask or pesticide respirator, jointly approved by the Mining Enforcement and Safety Administration (formerly the U.S. Bureau of Mines) and the National Institute for Occupational Safety and Health. Harmful if absorbed through skin. May cause eye irritation. Do not get in eyes, on skin, or on clothing. Remove contaminated clothing and wash before reuse.

ENVIRONMENTAL HAZARDS

For terrestrial uses, do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark.

This pesticide is toxic to birds and fish. Wildlife feeding on treated bait may be killed. Do not contaminate water by cleaning equipment or disposal of waste. Do not feed to livestock or poultry. Do not mix with grain for livestock or poultry feed.

Pick up and dispose of dead birds by burial.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

USE RESTRICTIONS

Do not use where food (grain or meat) might become contaminated.

Avitrol must not be exposed in any manner that may endanger desirable and protected bird species. If there is a question of such a hazard, consult local, state and federal game authorities before undertaking bird management with Avitrol.

Investigate local laws that may prohibit the use of any toxic chemical in bird control.

Applicators must wear protective clothing, including long sleeves, gloves and respirators when using this product.

STORAGE & DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

1. STORAGE INSTRUCTIONS:

Store in original container only. Store apart from food or animal feed and protect against rodent penetration of the carton. Store apart from other pesticides, fertilizers, food or feed that may cause cross-contamination of odor or insect infestation.

2. DISPOSAL INSTRUCTIONS:

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance. Completely empty liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment. Then dispose of liner in a sanitary landfill or by incineration if allowed by State and Local authorities. If drum is contaminated and cannot be reused, dispose of in the same manner.

RESTRICTED USE PESTICIDE

DUE TO ACUTE AVIAN TOXICITY

For sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's Certification



POWDER MIX

Active ingredient: 4-Aminopyridine

50.0%

Inert Ingredients:

50.0%

Total

100.0%

Avitrol is a poison with flock alarming properties used for the control of Starlings in, or in the immediate vicinity of feed lots in such a way that a part of a flock may react and frighten the rest away. Birds that react and alarm a flock usually die.

Avitrol Lot No. _____

KEEP OUT OF REACH OF CHILDREN

DANGER POISON

STATEMENT OF PRACTICAL TREATMENT

If swallowed: If the patient is unconscious, maintain breathing and heart beat (CPR: Cardiopulmonary resuscitation). Contact your local Poison Control Center, hospital or physician immediately.

If patient is conscious: Induce vomiting with syrup of ipecac. (If not available, stimulate the back of the throat with finger). Never give anything by mouth to an unconscious person. Contact your Poison Control Center, hospital or physician immediately.

If in eyes: Flush with plenty of water. Get medical attention if irritation persists.

On skin: Wash thoroughly with soap and water.

Inhaled: Remove victim to fresh air. If not breathing, give artificial respiration. Get medical attention.

See side panel for additional precautionary statements.

Manufactured By
AVITROL CORPORATION

7844 East 46th Street
Tulsa, Oklahoma 74145-6370
(918) 622-7763 • (800) 633-5069
EPA Reg. No. 11649-11
EPA Est. 11649-OK-1

Net Contents 0.707 oz. (20 grams)

PREBAITING DIRECTIONS

Prebaiting with the bait material to be used is usually essential to the effective deterrence of birds with Avitrol. This product must not be used where non-target birds are feeding. Careful observations of the birds' feeding habits must therefore be made to establish proper leading locations and to determine that no nontarget birds are feeding on the prebait. The Avitrol concentrate in this bag is for deposition on a suitable bait for the control of Starlings in and around feedlots. Livestock feed varies in different sections of the country and this provides a method of preparing alternative baits from attractive food materials.

BAIT PREPARATION

To prepare bread as bait, cut each of ten (10) standard slices of fresh bread into 16 equal pieces. Open and place into the plastic bag; close by twisting the top entrapping as much air as possible. Tumble and shake the contents until all the powder is evenly distributed over the pieces of bread with none remaining on the walls of the bag.

To prepare an alternative bait, such as french fries, steam flaked corn, etc. as baits: introduce approximately two pounds of the selected alternative bait material into the plastic bag and proceed as directed above for bread. Handle treated bait with a gloved hand and remove with soap and water any of the powder that may have adhered to the skin.

DILUTION DIRECTIONS

Using a gloved hand, scatter the contents of each bag of prepared bait over piles of untreated bait of the same composition at a ratio of approximately one part treated to nine parts untreated in areas where prebait was well accepted.

BAITING DIRECTIONS

To obtain minimal mortality, the distribution of Avitrol should be limited to scattered spot placements that will provide leading opportunities only for the necessary number of target birds. After the birds' feeding pattern has been established through prebaiting, replace untreated bait with diluted treated bait only at sites where the target birds are actively feeding. Do not apply treated bait to inactive feeding sites. Early morning applications are recommended. Repeat treatment on succeeding days until control is obtained. Where uneaten bait may be a hazard to other birds or animals, it should be picked up at the end of each day. Do not allow Avitrol treated bait to remain in unprotected places, where it may be mistaken for food by people or animals. This product must not be applied where nontarget bird species are feeding. Note that retreatment may also be necessary after rainfall.

Notice: Buyer and/or user assumes all risks of use and/or handling of these materials contrary to label instructions.

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS & DOMESTIC ANIMALS

CAUTION: Harmful if swallowed. May cause irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to birds and fish. Wildlife feeding on treated bait may be killed. Do not contaminate water by cleaning equipment or disposal of waste. Do not feed to livestock or poultry. Do not mix with grain for livestock or poultry feed.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

USE RESTRICTIONS

Do not use where food (grain or meat) might become contaminated.

Avitrol must not be exposed in any manner that may endanger desirable and protected bird species. If there is a question of such hazard, consult local, state and federal game authorities before undertaking bird management with Avitrol.

Investigate local laws that may prohibit the use of any toxic chemical in bird control.

STORAGE & DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

1. STORAGE INSTRUCTIONS:

Store in original container only. Store apart from food or animal feed and protect against rodent penetration of the carton. Store apart from other pesticides, fertilizers, food or feed that may cause cross-contamination of odor or insect infestation.

2. DISPOSAL INSTRUCTIONS:

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance. Completely empty liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment. Then dispose of liner in a sanitary landfill or by incineration if allowed by State and Local authorities. If drum is contaminated and cannot be reused, dispose of in the same manner.

RESTRICTED USE PESTICIDE

For sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's Certification.



WHEAT

Active Ingredient: 4-Aminopyridine

Inert Ingredients:

Total

0.5%

99.5%

100.0%

Avitrol is a poison with flock alarming properties used for the control of House Sparrows, Red-Winged, Yellow-Headed, Brewers and Rusty Blackbirds, Grackles, Cowbirds and Starlings in, on or in the area of structures, nesting, feeding and roosting sites, in such a way that a part of a flock may react and frighten the rest away. Birds that react and alarm a flock usually die.

KEEP OUT OF REACH OF CHILDREN CAUTION STATEMENT OF PRACTICAL TREATMENT

If swallowed: If the patient is unconscious, maintain breathing and heart beat (CPR: Cardiopulmonary resuscitation). Contact your local Poison Control Center, hospital or physician immediately.

If patient is conscious: Induce vomiting with syrup of Ipecac (if not available, stimulate the back of the throat with finger). Never give anything by mouth to an unconscious person. Contact your Poison Control Center, hospital or physician immediately.

If in eyes: Flush with plenty of water. Get medical attention if irritation persists.

See side panel for additional precautionary statements.

Manufactured By
AVITROL CORPORATION
7644 East 46th Street
Tulsa, Oklahoma 74145
(918) 622-7763 • (800) 633-5069
EPA Reg. No. 11649-1
EPA Est. 11649-QK-1

Avitrol Lot No.

Net Contents:

Pounds

PREBAITING DIRECTIONS

This product must not be applied where nontarget birds are feeding. Careful observations of the feeding habits must therefore be made to establish proper feeding locations and to determine the nontarget birds are feeding on the prebait. Prebaiting with untreated grains of the same composition as the Avitrol carrier is usually essential to the effective deterrence of birds with Avitrol. The target species are primarily ground feeders and should be prebaited on the ground when possible. In structures, prebaiting may be performed on elevated flat surfaces, perching areas and ledges. Trays may be used but feeding acceptance will likely require more time.

DILUTION DIRECTIONS

Avitrol treated grain should be thoroughly mixed with untreated grain of the same composition the Avitrol carrier at the dilution ratios indicated below. For the control of Blackbirds, Cowbirds, Starlings and Grackles with Avitrol, no dilution less than one part treated to nine parts untreated is recommended. House Sparrows, however, will operate within limited areas, with feeding sites relatively close to one another. Therefore, ratios of one part treated to nine (or more) untreated parts have given good control in most instances, particularly stubborn cases may require a ratio of one part treated to five parts untreated. Greater numbers of birds may be killed, however, as toxic bait is made less dilute.

BAITING DIRECTIONS

To obtain minimal mortality, the distribution of Avitrol should be limited to scattered spot placements which will provide feeding opportunities only for the necessary number of target birds. After the birds' feeding pattern has been established through prebaiting, replace untreated bait with diluted treated bait at sites where the target birds are actively feeding. Do not apply treated bait to inactive feeding sites. Where uneaten bait may be a hazard to other birds or animals, it should be picked up at the end of each day. This product must not be applied where nontarget bird species are feeding. During the few days, baiting with Avitrol may require successive applications until control is obtained. Note: retreatment may also be necessary after rain.

Notice: Buyer and/or user assumes all risks of and/or handling of these materials contrary to instructions.

M A T E R I A L S A F E T Y D A T A S H E E T

MANUFACTURER:

PM RESOURCES, INC., St. Louis, Missouri 63178

Phone: 314/291-6720
800/424-9300
(after hours)

PRODUCT NAME: Purina Starlicide, Technical; EPA #602-134
USDA APHIS WS Name: DRC-1339 Concentrate
EPA No's. 56228-10, 17, 28, 29, 30

Date: 10/18/89
Replaces:
9/12/89

1. HAZARDOUS INGREDIENTS:

3-Chloro-methylbenzenamine hydrochloride
(3-Chloro-p-toluidine hydrochloride)
CAS# 7745-89-3

% w/w
97.00

2. PHYSICAL/CHEMICAL CHARACTERISTICS:

Solubility in Water: Soluble

Appearance and Odor: Yellow powder; malodorous sulfur-type odor.

3. FIRE AND EXPLOSION HAZARD DATA:

Extinguishing Media: Water, dry chemical, carbon dioxide, foam

Unusual Fire and Explosion Hazards: nonflammable and nonexplosive

4. REACTIVITY DATA:

Stable.

Hazardous Polymerization: will not occur

5. HEALTH HAZARD DATA:

Mouse Oral LD₅₀ - 2000 mg/kg

Field Mice (Peromyscus) LD₅₀ - 1800 mg/kg

Rat Oral LD₅₀ - fasted male albino rats - 1770 mg/kg

fasted female albino rats - 1170 (830-1640) mg/kg

Rabbit Dermal LD₅₀ - greater than 1250 mg/kg

Sheep - Single Oral Doses

200 mg/kg - no deaths

400 mg/kg - one of two died

HEALTH HAZARD DATA, cont'd:

Chicken: -Single Oral Dose

<u>mg/kg</u>	<u>Killed/Total</u> mortality (time)
9	10/10 (2 days)
6	33/40 (2 days)
3	7/25 (3 days)

-Chronic Toxicity

<u>PPM in Diet</u>	<u>Killed/Total</u>
250	10/10
60	8/10
15	0/10

-Intraperitoneal Injection in Water

<u>mg/kg</u>	<u>Killed/Total</u>
6	7/10
3	3/10

-Dermal (1/2 ml aqueous solution poured on back feathers)
(3 week-old chicks, 200g)

<u>mg/kg</u>	<u>Killed/Total</u>
50	7/10
25	6/15

Pigeon Oral LD₅₀: 17 mg/kg

Redwing Blackbird Oral LD₅₀: 1.8-3.2 mg/kg

Magpie Oral LD₅₀: 5.6-17.7 mg/kg

Dogs (single oral dose in corn oil suspension):

<u>Dosage</u> <u>mg/kg</u>	<u>Sex</u>		<u>Mortality</u> <u>Dead/Alive</u>	<u>Days To</u> <u>Death</u>
	<u>M</u>	<u>F</u>		
1000	1	1	2/2	<1
500	1	1	2/2	3,3
250	2	-	2/2	1,1
100	-	2	2/2	3,1
50	-	1	0/1	-

HEALTH HAZARD DATA, cont'd.:

Route(s) of Entry: 1. inhalation-no
2. skin-yes
3. ingestion-yes

Carcinogenicity: 1. NTP-no
2. IARC-no
3. OSHA-no

Signs and Symptoms of Exposure: depression, hematuria, diuresis,
burning of skin and eyes.

Emergency and First Aid Procedures:

Eyes and Skin: flush with plenty of cool water.

If Swallowed: induce vomiting and call a physician.

Note: 3-Chloro-methylbenzenamine hydrochloride can cause cyanosis.

6. PRECAUTIONS FOR SAFE HANDLING AND USE:

1. Steps to be taken in case material is released or spilled: sweep up material and place in a suitable container.
2. Waste Disposal Method: disposal must be made in accordance with federal, state, and local laws.
3. Precautions to be taken in handling and storage: store in a cool, dry area away from foodstuffs.

7. CONTROL MEASURES:

1. Protective Gloves: rubber
2. Work/Hygienic Practices: wash hands thoroughly after handling.

While the information and recommendations set forth herein are believed to be accurate as of the date hereof, PM RESOURCES, INC. makes no warranty with respect thereto and disclaims all liabilities from reliance thereon.

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS (& DOMESTIC ANIMALS)

CAUTION

Harmful if swallowed, inhaled, or absorbed through the skin. Avoid contact with eyes, skin, or clothing. Handle only with protective gloves, clothing, and face mask, or respirator. Wash hands with soap and water after handling.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to birds. Do not expose in areas accessible to waterfowl, poultry, and other non-target birds. Keep out of lakes, ponds, streams, tidal marshes, and estuaries. Do not apply where runoff is likely to occur. Do not contaminate water by the cleaning of equipment or disposal of waste.

DIRECTIONS FOR USE

GENERAL

CLASSIFICATION

FOR DISTRIBUTION AND USE ONLY IN KENTUCKY.

It is a violation of State and Federal laws to use this product in a manner inconsistent with its labeling. (See Baiting Procedures.)

STORAGE AND DISPOSAL

PROHIBITIONS

Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited.

PESTICIDE DISPOSAL

Pesticide, mixture, or rinse that cannot be used or chemically repackaged should be disposed of in a landfill approved for pesticides.

CONTAINER DISPOSAL

Dispose of in an incinerator or landfill approved for pesticide containers.

GENERAL

Consult Federal, State or local disposal authorities for approved alternative procedures such as limited open burning.

RESTRICTED USE PESTICIDE

FOR DISTRIBUTION AND USE ONLY WITHIN KENTUCKY.
IT IS A VIOLATION OF FEDERAL LAW TO USE THIS PRODUCT IN A MANNER INCONSISTENT WITH ITS LABELING

For the control of feral pigeons, common crows, starlings, and winged blackbirds, common grackles, and house-headed cowbirds, READ THE ENTIRE LABEL, USE STRICTLY IN ACCORDANCE WITH PRECAUTIONARY STATEMENTS AND DIRECTIONS AND WITH APPLICABLE STATE AND FEDERAL REGULATIONS.

For sale to and use by USDA, APHIS, Animal Damage Control employees or persons working under their direct supervision.

COMPOUND DRC-1339 98% CONCENTRATE

FOR REFORMULATING PURPOSES ONLY

Active Ingredients

3-Chloro-p-toluidine hydrochloride 98.0%

Inert Ingredients 2.0%

TOTAL 100.0%

KEEP OUT OF REACH OF CHILDREN

CAUTION

STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: Induce vomiting and immediately call a physician.

IF INHALED: Move patient from contaminated area and immediately call a physician.

IF ON SKIN OR IN EYES: Immediately flush eyes or skin with large quantities of water. Call a physician immediately.

SEE SIDE PANEL FOR ADDITIONAL
PRECAUTIONARY STATEMENTS

FOLLOW ALL DIRECTIONS, RESTRICTIONS AND PRECAUTIONS WHICH APPEAR ON THE EPA-REGISTERED PRODUCT LABEL.
THIS LABEL MUST BE IN THE POSSESSION OF THE USER AT THE TIME OF PESTICIDE APPLICATION.

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
ANIMAL DAMAGE CONTROL
Louisville, KY

EPA Reg. No. 56228-10 Ky. Reg. No. SLN-KY 890003

Net Weight:

BAITING PROCEDURES

General: Before exposing treated baits, observe target population thoroughly to determine numbers of birds present, their feeding habits, their preferred feeding locations or bait preferences, "homing" or roosting areas, their daily activity patterns, and the relative abundance of non-target populations. During these observations, note details about for bait exposure. These data will be used when the target population can be baited efficiently and when non-target species are unlikely to feed.

After daily activity patterns of the birds have been noted and appropriate baiting locations selected, present small amounts of untreated ("clean") bait material to determine the bait base preferred by the target population. Continue baiting for several days or until a clear preference for a prebait has emerged and prebait is generally well accepted by the target population.

Do not place treated baits in locations accessible to children, pets, or domestic animals. Do not place treated baits in locations where non-target wildlife have been feeding upon prebait.

FERAL PIGEONS

USE RESTRICTIONS: For the control of feral pigeons (Columba livia) roosting or feeding on flat rooftops, or within fenced areas from which the public, pets, domestic animals, and most non-target wildlife can be excluded during the time that baits are used. Baits may only be applied in areas where non-target species are seldom encountered and have not been detected to have fed upon application sites during prebaiting and baiting. Prebaiting and baiting for feral pigeons must be made from one of the following: old grain, cracked corn, whole corn, commercial wild bird seed, or commercial pigeon mix.

Prebaiting: Prebaiting with clean, untreated bait that is accepted well by the target population is essential for good control. Apply prebait by spreading small amounts of different types of allowable prebait materials to determine bait preference. Once bait preference has been established use only the preferred bait. Increase amounts of prebait until daily bait consumption is determined. Prebait for 1 to 2 weeks or until prebait is generally well accepted. Change prebaiting locations if necessary to achieve good acceptance. Do not bait areas where prebait has not been accepted well or where non-target species have been eating prebait.

Bait Preparation: Mix toxic bait on site (if possible) just prior to application. Use the prebait material as the carrier for the toxicant.

Dissolve 1.35 oz. of DRC-1339 and 2 tbsp. of cornstarch in 32 oz. of water or edible oil. If an edible oil is used, the cornstarch may be omitted. Adjust the amount of liquid slightly if necessary to give uniform coverage.

Pour mixtures over 30 pounds of bait material or spray from a spray bottle. Mix or tumble slowly until mixture is evenly distributed over the grain. Prior to application, thoroughly mix 3 parts of treated bait with up to 5 parts of untreated bait of the same base.

Bait Application: Collect insecticide prebait and substitute the treated bait/untreated bait mixture at locations where prebait was accepted well (by pigeons only). A pilot treated bait at the same rate as the daily amount of prebait that was consumed. Expose bait in the same manner and at the same time of day as was used for prebaiting. Continue bait exposure until pigeons stop feeding on bait, the desired level of control is attained, or non-target species begin to feed upon the bait.

As DRC-1339 is a relatively slow-acting poison, most birds will die away from the roost. Pick up and properly dispose of all dead birds found.

CONTINUED ON SIDE PANEL

BAITING PROCEDURES

CROWS, STARLINGS, AND BLACKBIRDS

Use Restrictions: For control of common crows (*Corvus brachyrhynchos*), starlings (*Styrax vulgaris*), red-winged blackbirds (*Aegialitis phoenicea*), common grackles (*Quiscalus griseus*), and house finches (*Monticola sibilatrix*). In "staging" areas (in stubble fields, cut hay fields, orchards, or open grassy meadows) or structural roosts (in industrial sites, bridges, sheltered power lines, lawns, etc.). Do not apply baits in any way that it could constitute food or feed crops or that it could be ingested by livestock.

Feeder policies: Starlings, common grackles, and house finches may be used for prebait and bait. Whole corn may be used for crows and house finches, or feed products may be used in structural roosts.

Prebaiting: Prebaiting with feed, untreated bait that is accepted well by the target population is essential to determine preferred bait and baiting locations and to promote good acceptance of toxic bait. Prebait with the candidate material that was accepted best in prebait tests.

Staging areas:

Prebaiting: Scatter prebait at the rate of about 25 pounds per acre, or apply bait on large flat areas in staging areas used by the birds just prior to going to roost. Staging areas can only be identified by careful observation of the target birds' behavior just prior to going to roost.

Bait Preparation: Dissolve 1.6 oz. of DRC-1339 and 1 tbsp cornstarch in 16 oz. water or edible oil. If an edible oil is used, the cornstarch may be omitted. Adjust the amount of liquid slightly if necessary to give uniform coverage.

Pour mixture over 10 lbs. of bait material that was used for prebaiting or spray from spray bottle. Mix or tumble slowly until mixture is evenly distributed over the grain. Divide the DRC-1339 treated bait with untreated, clean bait at a rate of one part of treated bait to no more than 9 parts untreated bait.

Bait Application: Apply bait at a rate not to exceed 25 pounds toxic bait/untreated bait mixtures in locations within staging areas where prebait was accepted well by target species only. As DRC-1339 is a relatively slow acting poison, most birds will die away from the baited area. Pick up and dispose of all dead birds found.

Structural Roosts:

Bait Sites: Bait sites should be made of small containers such as 33 gallon plastic trash cans lids or 2"x2" wooden trays attached to pipes, rafters, eaves, or other structures where birds are roosting. The sites should be 15-20 feet apart, depending on the number of birds a container can accommodate. Place sites throughout the area where heavy bird use is indicated by the presence of droppings or from direct observation. All bait trays and bait sites should be propped with a sign to notify anyone who might inadvertently come across the bait tray or bait site of their presence and potential danger. Suggested wording for the sign:

KEEP AWAY

TOXIC BAITS

PIGEON/STARLING CONTROL PROJECT

(name and address of firm conducting program)

under permit by the

Kentucky Department of Agriculture

Prebaiting: Prebait using the same material that will be used as bait except without the addition of the DRC-1339 Concentrate. Place prebait at the rate of 5-10 pounds per container (depending on the size of the container). Each day remove all remaining prebait after birds leave in the morning and measure the amount of prebait being con-

sumed at each bait site daily. Once good acceptance has been established continue the prebait for 1 to 2 weeks or until the amount of prebait being eaten is equal to or near the amount being offered.

Bait Preparation: Bread/Cornmeal Bait: Take 10 pounds of bread and evenly cut into approximately 35 equal pieces per slice or use 10 pounds of sweet corn. Warm 16 pounds of water or use 16 pounds of water until it is liquid or use untreated vegetable oil. Thoroughly mix 1 oz. of DRC-1339 concentrate into the liquid oil. Dip the bread pieces or cornmeal into the DRC-1339 oil solution mixture and let drain and cool on screen. Mix the treated bread or cornmeal with approximately 40 pounds of untreated material of the same base before application.

Fried Potato Bait: Mix 1 oz. DRC-1339 concentrate and 1/3 cup dark corn syrup (sauce or dark molasses) into 42 oz. hot water. Apply onto 30 pounds of fried potatoes (14. French Fried) with paraffin or spray system during the potatoes while applying the mixture to form uniform coverage. Allow to dry overnight. Mix with 35 pounds of untreated fried potatoes before using. If prebaited, cut potatoes into 1" - 1 1/2" length pieces prior to application.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER

Harmful if swallowed, inhaled, or absorbed through the skin. Avoid contact with eyes, skin, or clothing. Handle only with protective gloves, clothing, and face mask, or respirator. Wash hands with soap and water after handling.

ENVIRONMENTAL HAZARDS

This product is toxic to birds. Do not expose in areas accessible to waterfowl, poultry, and other non-target birds. Keep out of lakes, ponds, streams, tidal marshes, and estuaries. Do not apply where runoff is likely to occur. Do not contaminate water by the cleaning of equipment or disposal of waste.

ENDANGERED SPECIES CONSIDERATIONS

Before undertaking any control operations with the product, consult with local, State, and Federal wildlife authorities to ensure the use of this product presents no hazard to any endangered species.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

READ THE ENTIRE LABEL. USE STRICTLY IN ACCORDANCE WITH PRECAUTIONARY STATEMENTS AND DIRECTIONS AND WITH APPLICABLE STATE AND FEDERAL REGULATIONS.

USE RESTRICTIONS

For the control of feral pigeons (Columba livia) at roosting or loafing areas on, in, or around buildings, and in areas from which the public, pets, domestic animals, and most nontarget wildlife can be excluded during the time that toxic bait is used.

Bait may only be applied in areas where nontarget species are seldom encountered and have not been detected to have fed upon prebait. Exclude unauthorized personnel from application sites during prebaiting and baiting. Do not place treated baits in locations accessible to children, pets or domestic animals.

To avoid potential for poisoning the Endangered Species listed below, use of this product is prohibited in the following areas:

SEE RIGHT PANEL FOR ADDITIONAL DIRECTIONS FOR USE.

RESTRICTED USE PESTICIDE

For retail sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicators certification.

For use exclusively by U.S. Department of Agriculture personnel trained in bird control or persons under their supervision.

COMPOUND DRC-1339

98% CONCENTRATE - Pigeons

For control of pigeons causing health, nuisance or economic problems in and around structures or in non-crop areas.

ACTIVE INGREDIENT:

3-Chloro-4-methylbenzenamine hydrochloride..... 98.0%

INERT INGREDIENTS:..... 2.0%

TOTAL..... 100.00%

KEEP OUT OF REACH OF CHILDREN

DANGER — POISON



STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: CALL A PHYSICIAN ON POISON CONTROL CENTER IMMEDIATELY!

IF SWALLOWED: Induce vomiting and immediately call a physician.

IF INHALED: Move patient from contaminated area and immediately call a physician.

IF ON SKIN OR IN EYES: Immediately flush eyes or skin with large quantities of water. Call a physician immediately.

SPECIAL LABEL

Net Weight

U.S. EPA Reg. No. 58228-1D-1

U.S. EPA Reg. No. 58228-28

U.S. DEPARTMENT OF AGRICULTURE
AND PLANT HEALTH INSPECTION SERVICE

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

STORAGE: Store only in original container, in a dry place inaccessible to children, pets and domestic animals.

PESTICIDE DISPOSAL: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spilled bait, or residue is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions contact your State Pesticide or Environmental Control Agency or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance.

CONTAINER DISPOSAL: Completely empty by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment, then dispose of bags in a sanitary landfill or by incineration as allowed by State and local authorities. If burned, stay out of smoke.

DIRECTION FOR USE (Cont)

Birds:

Prohibited Areas

Yellow-shouldered blackbird Puerto Rico

Puerto Rican plain pigeon Puerto Rico

Paraguayan falcon

Within 1/2 mile of peregrine falcon nests at times of year that falcons are present.

PREBAITING. Prebaiting may be helpful in enhancing bait acceptance by pigeons and in assessing the potential for exposing nontarget species to bait. Prebait and carriers for toxic baits must be made from whole corn.

Before exposing treated baits, observe target populations thoroughly to determine relative numbers of birds present, their feeding habits, their preferred feeding locations or their preferred "loafing" areas, their daily activity patterns, and the relative abundance of nontarget species at various locations routinely visited by target populations. Observe birds throughout the day. During these observations, note desirable sites for bait exposure. These sites will be areas where the target population can be baited efficiently and where nontarget species are unlikely to feed. After daily activity patterns of birds have been noted and appropriate baiting locations selected, apply whole-corn prebait on rooftops, in bait containers, or on bare ground (within fenced areas) at rates not to exceed 25 lbs./acre (0.25 kg/100 m²). Prebait for 1-2 weeks or until prebait is generally well accepted. Change prebaiting locations if necessary to achieve good acceptance. Do not apply toxic bait at sites where prebait has not been accepted well or where nontarget species have been eating prebait.

SEE REVERSE SIDE FOR ADDITIONAL DIRECTION FOR USE.

DIRECTIONS FOR USE (Cont.)

FORMULATION DIRECTIONS:

Dissolve one part Compound DRC-1339 Concentrate - Feedlots in an appropriate carrier and mix with the bait materials of choice as indicated below.

Following are examples of formulations that have effectively been used to treat a variety of grains. Grains are the preferred bait material when the target species are blackbirds, cowbirds, or grackles. Cracked corn is the bait of choice for grainivorous species.

Rollod Barley, Cracked Corn, Whole and Rolled Milo (1.8 - 2.0% bait): Dissolve 92 grams (3.2 oz) of Compound DRC-1339 Concentrate - Feedlots in 800 ml (1.3 pt) of warm potable water at 43°C (110°F). Binding agents, such as lecithin oils, latexes or polyvinyl acetates may be used on grain baits to enhance retention and reduce losses due to moisture. Pour the solution over 4.5 kg (10 lbs) of bait material and mix or tumble slowly until mixture appears evenly distributed. Air dry at ambient temperature. Screen baits to remove small particles and dust. Dilute at no less than 1:10 with similar untreated bait. Use treated baits within 7 days.

Rollod Whole Corn (0.9 - 1.0% bait): Dissolve 46 grams (1.6 oz) of Compound DRC-1339 Concentrate - Feedlots in 600 ml (1.3 pt) of warm potable water at 43°C (110°F). Binding agents, such as lecithin oils, latexes or polyvinyl acetates may be used on grain baits to enhance retention and reduce losses due to moisture. Pour the solution over 4.5 kg (10 lbs) of rolled whole corn and mix or tumble slowly until mixture appears evenly distributed. Air dry at ambient temperature. Screen baits to remove small particles and dust. Dilute at no less than 1:5 with untreated rolled whole corn. Use treated bait within 7 days.

FORMULATION DIRECTIONS (continued):

Following are three examples of formulations that have effectively been used to treat a variety of non-grain baits. Poultry pellets and soft baits should be used when the target species is starlings. Poultry pellets are the bait of choice because of their selectivity for omnivorous species.

Poultry Pellets (0.9 - 1.0% bait): Dissolve 46 grams (1.6 oz) of Compound DRC-1339 Concentrate - Feedlots in 600 ml (1.3 pt) of warm potable water at 43°C (110°F). Binding agents, such as lecithin oils, latexes or polyvinyl acetates may be used on grain baits to enhance retention and reduce losses due to moisture. Pour the solution over 4.5 kg (10 lbs) of poultry pellets and mix or tumble slowly until mixture appears evenly distributed. Air dry at ambient temperature. Screen baits to remove small particles and dust. Dilute at no less than 1:5 with untreated poultry pellets. Use treated bait within 7 days.

Whole Ratsina (0.2% bait): Dissolve 9.2 gm (0.3 oz) of DRC-1339 Concentrate - Feedlots in 120 ml (0.3 pt) of warm potable water at 43°C (110°F). Pour the solution over 4.5 kg (10 lbs) of ratsina and mix or tumble slowly until mixture appears evenly distributed. Air dry at ambient temperature. Dilute at no less than 1:2 with untreated ratsina. Post the treated area with warning signs during the baiting operation. Use treated ratsina within 24 hours.

Cull French Fries (0.2% bait): Dissolve 46 grams (1.6 oz) of Compound DRC-1339 Concentrate - Feedlots in 600 ml (1.3 pt) of warm potable water at 43°C (110°F). Pour the solution over 23 kg (50 lbs) of cull French fries and mix or tumble slowly until mixture appears evenly distributed. Air dry at ambient temperature. Dilute at no less than 1:2 with untreated cull French fries. Post the area with warning signs during the baiting operation. Use treated French fries within 24 hours.

Note: For any bait prepared from this product, it is important to dilute treated bait particles with untreated particles at the appropriate ratio (see directions above). Diluting baits will reduce the possibility of any target bird consuming more than one lethal bait and should allow more target birds an opportunity to consume a lethal bait.

APPLICATION DIRECTIONS:

APPLICATION IN BEEF CATTLE FEEDLOTS: With gloved hands, place bait in feeding stations or scatter diluted bait thinly and uniformly at a rate of 2.5 kg/100m² (1 lb/1000 ft²) over dry or frozen areas in pens and alleys before target birds arrive in the morning. Place bait in areas inaccessible to livestock. DO NOT bait pens within the feedlot which are occupied by cattle.

APPLICATION IN POULTRY, SWINE, AND DAIRY CATTLE FEEDLOTS: Place in feeding stations or hand scatter thinly and uniformly over dry or frozen areas at a rate of 2.5 kg/100m² (1 lb/1000 ft²) on the PERIMETER of the lot OUTSIDE the pen areas occupied by poultry, swine, or dairy cattle. DO NOT bait pens within the feedlots which are occupied by poultry, swine, or dairy cattle.

SPECIMEN LABEL

FlightControl® General Application Guidelines

- ☐ Survey property to determine areas of treatment based on bird roosting, loafing, and feeding patterns.
- ☐ Determine sprayer calibration and apply FlightControl to turf at a rate of 1/2 gallon FlightControl per acre (1.5 oz. per 1,000 sq. ft.)
- ☐ Apply FlightControl with LESCO® Spreader Sticker to improve adhesion for weatherproof performance.
- ☐ Application with LESCO Tracker® dye is recommended for large areas for complete coverage.
- ☐ FlightControl can be tank-mixed with a plant growth regulator such as Primo® or Proxy™ to extend product performance and time between mowings.
- ☐ Apply when turf is dry.
- ☐ Allow time for treatment to dry prior to irrigation or precipitation (approximately 2 hours).
- ☐ Clean spray equipment after applications.
- ☐ Monitor bird behavior following treatment. Birds will typically begin to avoid treated area after 1-2 days of exposure to FlightControl.

FlightControl® is a registered trademark of DCV, Inc.

LESCO® and Tracker® are registered trademarks of LESCO, Inc.

Primo® is a registered trademark of Novartis

Proxy™ is a registered trademark of Rhone-Poulenc Ag Co.

FLIGHT CONTROL®

FOR GEESE REPELLENCY

EPA Reg. No. 69969-1

EPA Est. No. 10404-OH-02

ACTIVE INGREDIENT

9, 10 anthraquinone 50%

INERT INGREDIENTS 50%

Total 100%

For Best Results: Product may separate if allowed to sit. Resuspend with agitation. Keep from freezing.

KEEP OUT OF REACH OF CHILDREN CAUTION

STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: Call a physician or poison control center. Drink one or two glasses of water and induce vomiting by touching back of throat. If person is unconscious, do not give anything by mouth and do not induce vomiting.

IF ON SKIN: Wash with plenty of soap and water. Get medical attention if irritation persists.

IF IN EYES: Flush with plenty of water. Call a physician if irritation persists.

IF INHALED: Remove victim to fresh air. If not breathing, give artificial respiration preferably mouth to mouth. Get medical attention.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION

Harmful if swallowed. Harmful if absorbed through skin. Avoid contact with skin, eyes or clothing. Wash thoroughly with soap and water after handling. Harmful if inhaled. Avoid breathing vapor or spray mist. Remove contaminated clothing and wash clothing before reuse. Causes moderate eye irritation. Avoid contact with eyes or clothing.

ENVIRONMENTAL HAZARDS:

Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA. Do not contaminate water by cleaning of equipment or disposal of waste. Apply this product only as specified on this label.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

USE RESTRICTIONS:

This product may be used to repel geese, including Canada geese.

For Professional Application to Lawns.

- Repels geese from terrestrial areas at or near airports.
- Repels geese from grassy areas at commercial sites, industrial sites, municipal sites or in developed urban areas.
- Repels geese from golf courses, ornamental nurseries and conifer nurseries.
- Repels geese from landfills and dumpsites.
- Repels geese from building roofs, window sills and ledges.

To prevent contamination to the dilute solution of Flight Control® by other chemical residues be sure that the equipment is thoroughly clean before use or use dedicated equipment.

This product must be applied using properly calibrated and maintained spray equipment. Do not apply when surface to be treated is wet or when rain is expected. For Best results, product should dry on turf grass surface prior to rainfall. Mowing treated areas will remove product and reduce product effectiveness.

For sale to and application by professional applicators only. Do not apply this product in a way that will contact workers or other persons, either directly or through drift.

MIXING DIRECTIONS:

Thoroughly shake or stir Flight Control® prior to diluting with water.

APPLICATION DIRECTIONS:

When geese have been determined to be a nuisance, Flight Control® should be applied according to the following rates to the grassy, turf, forage or structural areas where geese are expected to feed/roost. To determine if the geese are a nuisance, a visual inspection (bird count) should be conducted by responsible officials/parties before application.

Grassy or Turf Areas, Landfills, Dumpsites:

- In most cases, dilute 2 quarts of Flight Control® with 50 gallons of water and apply per acre of grass, turf or land surface. (1.5 oz. Flight Control® per 1,000 sq. feet). You might need to use as much as one gallon diluted in 50 gallons of water per acre for extreme bird pressure. Your supplier will provide individualized assistance on concentrations to be used under existing conditions.
- Spray at weekly intervals or as required by geese activity.

Public, Municipal or Industrial Buildings:

- Apply 3 fluid ounces (0.12 lb. a.i.) of Flight Control® in 5 gallons of water per 1,000 square feet of building surface (roof, window sills, ledges) area.

Mix with water based on spray equipment specifications and recommendations. Apply using a fine spray pattern to evenly distribute over entire surface to be treated. Allow material to dry before permitting human activity in the treated area. Spray at weekly intervals or as required by geese activity and anticipated seasonal migrations. When applying to turf, cutting of the lawn will reduce amount of repellent available.

STORAGE AND DISPOSAL

STORAGE:

Do not allow containers to freeze. After prolonged storage, product may separate. If this occurs, resuspend with agitation.

PROHIBITIONS

Do not contaminate water, food or feed by storage, disposal or cleaning of equipment.

PESTICIDE DISPOSAL

Pesticide wastes are toxic. Improper disposal of excess pesticide or rinse is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance. ENVIRONMENTAL BIOCONTROL INTL. also can be contacted for guidance on the disposal of pesticide wastes.

CONTAINER DISPOSAL (PLASTIC)

Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill or incinerator or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

GENERAL: CONSULT FEDERAL, STATE OR LOCAL DISPOSAL AUTHORITIES FOR APPROVED ALTERNATIVE PROCEDURES.

CONDITIONS OF SALE AND WARRANTY:

Environmental Biocontrol Intl., a Division of DCV, Inc., warrants that the product conforms to its chemical description and is reasonably fit for the purpose stated on the label only when used in accordance with label directions under normal conditions of use. Since timing, method of application, weather and ground conditions, mixture with other chemicals, and other factors affecting the use of this product are beyond our control, no warranty is given concerning the use of this product contrary to label directions, or under conditions which are abnormal or not reasonably foreseeable.

DCV, INC. MAKES NO OTHER WARRANTIES EITHER EXPRESS OR IMPLIED WARRANTIES INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE.

Handling, storage and use of the product by Buyer or User are beyond the control of DCV, Inc. and Seller. Risks such as ineffectiveness or other directions will be assumed by the Buyer or User.

IN NO CASE WILL DCV, INC. OR SELLER BE HELD LIABLE FOR CONSEQUENTIAL, SPECIAL OR INDIRECT DAMAGES RESULTING FROM THE HANDLING, STORAGE OR USE OF THIS PRODUCT, NOR HELD RESPONSIBLE FOR INJURY OR LOSS AS A RESULT OF THE HANDLING OR USE OF THIS PRODUCT.

MANUFACTURED BY:

ebi environmental
biocontrol, intl.

A Division of DCV, Inc.

Wilmington, DE 19810

PRECAUTIONARY STATEMENT

HAZARDS TO HUMANS & DOMESTIC ANIMALS

CAUTION: Avoid contact with eyes or clothing. When handling, wear safety glasses. Wash thoroughly with soap and water after handling.

ENVIRONMENTAL HAZARDS

For terrestrial uses, do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. This pesticide is slightly toxic to aquatic invertebrates.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

FOGGING

USE RESTRICTIONS: This product may be used in area applications to repel nuisance birds from 1) electrical substations and structures; 2) buildings and structures that are not in/on or adjacent to natural or fish-bearing bodies of water. Use caution when there are risks of direct exposure to humans, pets, domestic animals, or nontarget wildlife. Do not apply this product in areas where plant toxicity is likely to occur. Use caution when there are risks of discoloration of plants, painted structures, or other valuable property. Do not smoke while applying this product.

APPLICATION DIRECTIONS: Apply this formulation undiluted by use of thermal or mechanical fog/smoke generators that can deliver particles within the aerosol size range (below 30 microns). Birds must be exposed to airborne TP-40 if it is to achieve lasting results.

Withhold treatment until conditions favoring successful use arise. TP-40 should be applied when birds have settled down in the roosting areas.

Apply undiluted TP-40 at rates of 1 to 4 ounces per 10,000 cubic feet of space to be treated. Hold fog generator's applicator at least 5 feet from objects to be fogged. Repeat treatment as necessary to achieve desired results. Several treatments, 1 to 4 days apart, may be needed.

ReJeX-IT® TP-40

Bird Repellent

STORAGE & DISPOSAL

Do not contaminate water, food, or feed by storage and disposal.

STORAGE: Store only in original container, in a dry place inaccessible to children, pets and domestic animals. Store apart from pesticides, fertilizers, food or feed that may cause cross-contamination from odor. Keep container closed when not in use.

REPELLENT DISPOSAL: Avian Aversion Agent, or rinse water that cannot be used according to label instructions must be disposed of according to Federal or approved State procedures. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER DISPOSAL: Triple rinse. The offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedure approved by State and local authorities.

ACTIVE INGREDIENT:	
Methyl Anthranilate(MA), methyl 2-aminobenzoate	40.0 %
INERT INGREDIENTS	
	60.0 %
TOTAL	100.0 %

This product contains 3.16 pounds of Methyl Anthranilate per gallon of product.

ReJeX-IT® TP-40 has been formulated from Food Grade ingredients with an active ingredient that exceeds US Food Chemical Codex (FCC) specifications.

KEEP OUT OF REACH OF CHILDREN

CAUTION

See Left Panel for additional precautionary statements.

Manufactured for:

RJ Advantage, Inc.

501 Murray Road, Cincinnati, Ohio 45217
EPA EST. No. 71838-OH-001 EPA Reg. No.: 58035-7

NET CONTENT: 5 gal NET WEIGHT: 40 lb

WARRANTY STATEMENT

NOTICE: The manufacturer warrants that this product conforms to the chemical description on its label. When used in accordance with label directions under normal conditions, this product is fit for its intended purpose. Since timing, method of application, weather and ground conditions, mixture with other chemicals, and other factors affecting the use of this product are beyond our control, no warranty is given concerning the use of this product contrary to label directions, or under conditions which are abnormal or not reasonably foreseeable. The buyer and/or user assumes all risks of any such use.

MATERIAL SAFETY DATA SHEET

SECTION I

EPA EST. NO.:	68607-OH-001
MANUFACTURED FOR:	RJ Advantage, Inc.
ADDRESS:	501 Murray Road Cincinnati, OH 45217
EMERGENCY TELEPHONE:	(513) 242-3300
FOR TRANSPORTATION EMERGENCY:	(800) 424-9300
CHEMICAL NAME AND SYNONYMS:	Proprietary Formulation
TRADE NAMES AND SYNONYMS:	ReJeX-iT® TP-40
CHEMICAL FAMILY:	Aromatic Acid Ester
DOT SHIPPING DESCRIPTION:	Not Regulated
PRODUCT NUMBER:	X20RJ4125

SECTION II INGREDIENTS

<u>MATERIAL</u>	<u>WT %</u>	<u>EXPOSURE LIMITS</u>
Methyl Anthranilate †	~ 40	Not Assigned
Inert Ingredients *	~ 60	Not Assigned

* Trade Secret available to health personnel upon request

† Not hazardous per OSHA 29CFR1910.1200

SECTION III PHYSICAL DATA

BOILING POINT:	208° C, 406° F
FREEZING POINT:	-4° C
SPECIFIC GRAVITY @ 25° C:	.953
VAPOR PRESSURE @ 25° C:	5.5 mm Hg
VAPOR DENSITY:	N/A
SOLUBILITY IN WATER:	Insoluble
% VOLATILES BY VOLUME:	N/A
EVAPORATION RATE:	N/A
APPEARANCE AND ODOR:	Clear blue liquid. Grape like odor

SECTION VI REACTIVITY DATA

STABILITY: Stable

INCOMPATIBILITY: Oxidizing Agents

HAZARDOUS DECOMPOSITION PRODUCTS: BY FIRE: Carbon Dioxide, Carbon Monoxide and Oxides of Nitrogen.

HAZARDOUS POLYMERIZATION: Will not occur

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE THE MATERIAL IS SPILLED OR RELEASED: Spilled material can be collected and placed in a covered waste disposal container.

WASTE DISPOSAL METHOD: Spray mixture, or rinse water that cannot be used according to label instructions must be disposed of according to Federal or approved State procedures. Waste resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

SECTION VIII SPECIAL PROTECTIVE INFORMATION

RESPIRATORY PROTECTION: N/A

VENTILATION: Local exhaust preferable, general exhaust acceptable if in an enclosed area.

PROTECTIVE GLOVES: Wear rubber gloves for long or repeated contact.

EYE PROTECTION: Wear safety glasses with unperforated sideshields.

OTHER PROTECTIVE EQUIPMENT: Eye wash, safety shower.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Store only in original container, in a dry place inaccessible to children, pets, and domestic animals. Store apart from pesticides, fertilizers, food or feed that may cause cross-contamination from odor.

OTHER PRECAUTIONS: Avoid excessive exposure. Keep away from open flames. Keep container closed when not in use. Use in ventilated areas only.

SECTION X REGULATORY STATUS

Registered for use as a bird-aversion agent under Federal Insecticide, Fungicide & Rodenticide Act (FIFRA) administered by the United States Environmental Protection Agency (US EPA); meets the criteria for "reduced risk" (Pesticide Regulation Notice 93-9). EPA Reg. No. is #58035-7.

ReJeX-iT® TP-40 is formulated from food grade ingredients with an active ingredient that exceeds U.S. Food Chemical Codex (FCC) specifications.

The active ingredient is classified as a naturally occurring flavorant by the US EPA and is included in the Generally Recognized As Safe list (GRAS, 21CFR182.60) by the US FDA. Inert ingredients are GRAS listed, also.

PREPARED: July 15, 1998
SUPERSEDES: June 05, 1997

The information contained herein is based on the data available to us and is believed to be correct as of the date prepared, however, RJ ADVANTAGE, INC. makes no warranty, expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof.

TECH NOTE

Animal Damage Control

United States
Department of
Agriculture

Animal and
Plant Health
Inspection
Service

October 1996

Egg Oil: An Avian Population Control Tool

The Animal and Plant Health Inspection Service's Animal Damage Control (ADC) program uses many methods to manage populations of gulls, waterfowl, and other birds in areas where they create problems. Methods include trapping and relocation, surgical sterilization, mechanical scare devices, repellants, and hunting. However, these methods, and others that reduce or prevent eggs from hatching—such as shaking, freezing, adding, nest destruction, and egg removal—are labor intensive and may not be effective in operational programs.

The application of various oils (of mineral and vegetable origin) to eggs during the nesting season to prevent hatching is less labor intensive. In addition, this method has an advantage over nest destruction or egg removal because nesting birds are encouraged to continue incubation, often well beyond the normal time for hatching. With nest destruction or egg removal, birds often re-nest.

On March 6, 1996, the U.S. Environmental Protection Agency (EPA) published in the Federal Register a notice exempting certain materials from regulation under Section 25(b) of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), as amended. This notice allowed corn oil to be used without EPA regulation as long as the uses met certain qualifications: they were not related to public health, efficacy data were available, and certain labeling requirements were met.

This tech note addresses the requirements of the March 6, 1996, EPA notice so that corn oil (hereafter referred to as "egg oil") can be used to treat the eggs of nesting gulls, waterfowl, and other birds. Egg oil will reduce reproductive success and, therefore, reduce the populations of birds that are causing problems. Laboratory and field studies conducted by ADC's Denver Wildlife Research Center show that egg oil is 95- to 100-percent

effective in preventing the hatching of treated eggs. The active ingredient is 100-percent food-grade corn oil.

Endangered Species Considerations

Before using egg oil, consult with appropriate wildlife authorities to ensure that the use of this product presents no hazard to threatened or endangered species.

It may be necessary to obtain a permit from the U.S. Department of the Interior's U.S. Fish and Wildlife Service and/or the applicable State or local wildlife agency before egg oil can be used. Also, contact the appropriate State regulatory agency to assure that egg oil can be used in the State under a FIFRA Section 25(b) exemption. Obtaining all required permits and licenses is the responsibility of the applicator.

General Information

Egg oil must be used as described in this tech note to conform to the FIFRA Section 25(b) exemption requirements specified by EPA. A copy of this tech note must be in the possession of any individual applying egg oil. Egg oil is natural, food-grade corn oil. When applied to incubating eggs, it blocks the pores in the eggshells and asphyxiates the developing embryo. Because the eggs are not otherwise disturbed, incubating birds will generally continue incubation to the expected hatching date and beyond, preventing or reducing the potential for re-nesting.

Obtaining Egg Oil

Applicators can obtain egg oil from any retail or wholesale supplier of groceries or baking or cooking supplies. Any commercially available brand of 100-percent food-grade corn oil may be used. Other pure vegetable oils and vegetable-oil mixtures are not covered by this tech note and may not meet the EPA exemption authorized by Section 25(b) of FIFRA.

Equipment

Egg oil may be applied to incubating eggs by any means that allows about the same amount of oil to be applied to each egg without excessive contamination of the nest and surrounding area. The most

effective application equipment is pressurized back-pack or hand-held sprayers that hold from 1 to 2 gallons of Egg Oil. Sprayers should be pressurized to between 15lb/in² and 40 lb/in² and should be calibrated to deliver between 3 to 6 ml/sec. The applicator wand should contain a tip that produces a fan-spray or circular pattern.

Application:

Monitor the breeding and nesting activity of birds targeted for treatment with Egg Oil. To be most effective, application of Egg Oil should be made between the 5th day after the laying of the last eggs in a clutch and at least 5 days before anticipated hatching, if possible. Treat all eggs in a nest at the same time and do not move or turn eggs. For colonial nesting birds, such as gulls, newly completed clutches may have to be treated at 10 day intervals to assure complete coverage. For pressurized sprayers, place the wand tip from 6 to 8 in. above each egg and apply an appropriate amount of Egg Oil. The amount of Egg Oil used varies with egg size. Treat goose eggs with approximately 7 ml Egg Oil/egg and gull eggs with 2ml/egg.

Storage And Disposal:

Store in original container. Containers should be recycled or disposed of in an appropriate landfill.

Potential Hazards:

Hazards to applicators are not expected unless the applicator is allergic to corn oil. Because Egg Oil applied to eggs of any bird will result in embryo death, care should be taken in mixed nesting colonies to identify and mark the nests of nontarget birds so they are not treated. Egg Oil should not be sprayed or applied to anything other than eggs and should not be applied directly to water.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS **DANGER**

May be fatal if swallowed, harmful if inhaled, or absorbed through the skin. Do not breathe vapors or dust. Corrosive, causes eye and skin damage. Do not get in eyes, on skin, or on clothing. Wear goggles or face shield and rubber gloves when handling. Wash hands with soap and water after handling.

ENVIRONMENTAL HAZARDS

This product is toxic to birds. Do not expose in areas accessible to waterfowl, poultry, and other non-target birds. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not apply where runoff is likely to occur. Do not contaminate water by the cleaning of equipment or disposal of waste.

ENDANGERED SPECIES CONSIDERATIONS

Before undertaking any control operations with the product, consult with local, State, and Federal wildlife authorities to ensure the use of this product presents no hazard to any endangered species.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

GENERAL INFORMATION: Compound DRC-1339 Concentrate is a slow acting avicide for the control of blackbirds, cowbirds, grackles, and starlings. Birds ingesting treated bait(s) die within one to three days. Use only cracked corn, whole or rolled milo, poultry pellets, or cracked or rolled corn unless prebait observations have demonstrated that these baits are not accepted by the target species or present undue risk to non-target animals. Poultry pellets and rolled or cracked corn are generally accepted by starlings. Cracked corn or rolled or whole milo by blackbirds. Other bait materials (French fries, raisins, etc.) may only be used if it is demonstrated that they are preferred by the target species and the non-target risks are equal to or less than those for cracked or rolled corn, whole or rolled milo, or poultry pellets.

NOTE: WHEN CONTROLLING BLACKBIRDS, COWBIRDS, AND GRACKLES, IT MAY BE NECESSARY TO OBTAIN A KILL-PERMIT FROM THE U.S. FISH AND WILDLIFE SERVICE AND/OR THE APPLICABLE STATE WILDLIFE AGENCY.

RESTRICTED USE PESTICIDE DUE TO HIGH ACUTE TOXICITY TO BIRDS

For retail sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicators certification. For use only by U.S. Department of Agriculture personnel trained in bird control or persons under their direct supervision.

COMPOUND DRC-1339 CONCENTRATE - FEEDLOTS

For bird control in feedlots

ACTIVE INGREDIENT:

3-Chloro-4-methylbenzenamine hydrochloride

97.0%

INERT INGREDIENTS:

TOTAL: 100.0%

KEEP OUT OF REACH OF CHILDREN



STATEMENT OF PRACTICAL TREATMENT IF SWALLOWED: CALL A PHYSICIAN OR POISON CONTROL CENTER IMMEDIATELY!

IF SWALLOWED: Induce vomiting and immediately call a physician.

IF INHALED: Move patient from contaminated area and immediately call a physician.

IF ON SKIN OR IN EYES: Immediately flush eyes or skin with large quantities of water. Call a physician immediately.

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE

Hyaltsville, MD 20782

EPA Reg. No. 56228-10

EPA Est. No. 56228-ID-1

Net Weight 8 oz.

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal. **STORAGE:** Store only in original container, in a dry place inaccessible to children, pets and domestic animals.

PESTICIDE DISPOSAL: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spilled bait, or residue is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

CONTAINER DISPOSAL: Completely empty by shaking and inverting sides and bottom to loosen clinging particles. Empty residue into application equipment, then dispose of bag in a sanitary landfill or by incineration if allowed by State and local authorities. If burned, stay out of smoke.

DIRECTIONS FOR USE (Cont.) USE RESTRICTIONS

Application of treated bait(s) in any problem area should be made only after careful observation of bird feeding habits to locate preferred feeding sites, determine the optimum time of application, and evaluate hazards of the application to desirable or protected animals. **DO NOT** apply bait(s) in areas where there is danger of consumption by endangered species. Prebaiting may be necessary to obtain successful results. When baiting is completed, remove all unconsumed bait material and dispose of in accordance with applicable state or federal laws. Carcasses of dead or dying birds that are found should be collected and either burned or buried according to applicable laws.

TARGET SPECIES:

Brewer's blackbird (*Euphagus cyanocephalus*)
Brown-headed cowbird (*Molothrus ater*)
Common grackle (*Quiscalus quisquilius*)
Red-winged blackbird (*Agelaius phoeniceus*)
Starling (*Sturnus vulgaris*)

When in mixed flocks with one or more of the species listed above, the following species also shall be considered to be target species: boat-tailed grackle (*Quiscalus major*), great-tailed grackle (*Quiscalus mexicanus*), in-colored blackbird (*Agelaius tricolor*), and yellow-headed blackbird (*Xanthocephalus xanthocephalus*).

SEE REVERSE SIDE FOR ADDITIONAL
DIRECTIONS FOR USE

DIRECTIONS FOR USE (Cont.)

FORMULATION DIRECTIONS:

Dissolve one part Compound DRC-1339 Concentrate - Feedlots in an appropriate carrier and mix with the bait materials of choice as indicated below.

Following are example of formulations that have effectively been used to treat a variety of grains. Grains are the preferred bait material when the target species are blackbirds, cowbirds, or grackles. Cracked corn is the bait of choice for gnatcatcher species.

Rolls Barley, Cracked Corn, Whole and Rolled Milo (1.8 - 2.0% bait): Dissolve 92 grams (3.2 oz) of Compound DRC-1339 Concentrate - Feedlots in 600 ml (1.3 pt) of warm potable water at 43°C (110°F). Binding agents, such as lecithin oils, latexes or polyvinyl acetates may be used on grain baits to enhance retention and reduce losses due to moisture. Pour the solution over 4.5 kg (10 lbs) of bait material and mix or tumble slowly until mixture appears evenly distributed. Air dry at ambient temperature. Screen baits and do not use bait materials that have less than 5000 particles/lb or more than 25,000 particles/lb. Dilute treated baits at no less than 1:10 with similar untreated bait. Use treated baits within 7 days.

Rolls Whole Corn (0.9 - 1.0% bait): Dissolve 46 grams (1.6 oz) of Compound DRC-1339 Concentrate - Feedlots in 600 ml (1.3 pt) of warm potable water at 43°C (110°F). Binding agents, such as lecithin oils, latexes or polyvinyl acetates may be used on grain baits to enhance retention and reduce losses due to moisture. Pour the solution over 4.5 kg (10 lbs) of milled whole corn and mix or tumble slowly until mixture appears evenly distributed. Air dry at ambient temperature. Screen baits to remove small particles and dust. Dilute at no less than 1:5 with untreated rolls whole corn. Use treated bait within 7 days.

FORMULATION DIRECTIONS (continued):

Following are three examples of formulations that have effectively been used to treat a variety of non-grain baits. Poultry pellets and soft baits should be used when the target species is starlings. Poultry pellets are the bait of choice because of their selectivity for omnivorous species.

Poultry Pellets (0.9 - 1.0% bait): Dissolve 46 grams (1.6 oz) of Compound DRC-1339 Concentrate - Feedlots in 600 ml (1.3 pt) of warm potable water at 43°C (110°F). Binding agents, such as lecithin oils, latexes or polyvinyl acetates may be used on grain baits to enhance retention and reduce losses due to moisture. Pour the solution over 4.5 kg (10 lbs) of poultry pellets and mix or tumble slowly until mixture appears evenly distributed. Air dry at ambient temperature. Screen baits to remove small particles and dust. Dilute at no less than 1:5 with untreated poultry pellets. Use treated bait within 7 days.

Whole Raisins (0.2% bait): Dissolve 9.2 gm (0.3 oz) of DRC-1339 Concentrate - Feedlots in 120 ml (0.3 pt) of warm potable water at 43°C (110°F). Pour the solution over 4.5 kg (10 lbs) of raisins and mix or tumble slowly until mixture appears evenly distributed. Air dry at ambient temperature. Dilute at no less than 1:2 with untreated raisins. Post the treated area with warning signs during the baiting operation. Use treated raisins within 24 hours.

Cull French Fries (0.2% bait): Dissolve 46 grams (1.6 oz) of Compound DRC-1339 Concentrate - Feedlots in 600 ml (1.3 pt) of warm potable water at 43°C (110°F). Pour the solution over 23 kg (50 lbs.) of cull French fries and mix or tumble slowly until mixture appears evenly distributed. Air dry at ambient temperature. Dilute at no less than 1:2 with untreated cull French fries. Post the area with warning signs during the baiting operation. Use treated French fries within 24 hours.

Note: For any bait prepared from this product, it is important to dilute treated bait particles with untreated particles at the appropriate ratio (see directions above). Diluting baits will reduce the possibility of any target bird consuming more than one lethal bait and should allow more target birds an opportunity to consume a lethal bait.

APPLICATION DIRECTIONS:

APPLICATION IN BEEF CATTLE FEEDLOTS: Wear gloves when handling bait. Place bait into feeding stations or scatter diluted bait thinly and uniformly at a rate of 2.5 kg/100m² (1 lb/1000ft²) over dry or frozen areas in pens and alleyways before target birds arrive in the morning. Place bait in areas inaccessible to livestock. DO NOT bait pens within the feedlot which are occupied by cattle.

APPLICATION IN POULTRY, SWINE, AND DAIRY CATTLE FEEDLOTS: Wear gloves when handling bait. Place bait into feeding stations or hand scatter baits thinly and uniformly over dry or frozen areas at a rate of 2.5 kg/100m² (1 lb/1000ft²) on the PERIMETER of the lot OUTSIDE the pen areas occupied by poultry, swine, or dairy cattle. DO NOT bait pens within the feedlots which are occupied by poultry, swine, or dairy cattle.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS DANGER

Fatal if swallowed, inhaled if inhaled or absorbed through the skin. Do not breathe vapors or dust. Corrosive, causes eye and skin damage. Do not get in eyes, on skin, or on clothing. Wear goggles, face shield or mask, rubber gloves, and protective clothing when handling. Wash hands with soap and water after handling.

ENVIRONMENTAL HAZARDS

This product is toxic to birds and aquatic invertebrates. Do not apply directly to water, or to areas where surface water is present, or to incidental areas below the main high tide mark. Runoff may be hazardous to aquatic organisms in neighboring areas. Do not contaminate water when disposing of equipment washwaters or rinsate.

ENDANGERED SPECIES CONSIDERATIONS

Before undertaking any control operations with the product, consult with local, State, and Federal wildlife authorities to ensure the use of this product presents no hazard to any endangered species.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

DRC-1339 is a slow-acting, systemic. Birds ingesting treated bait die 1 to 3 days later. Use poultry pellets, cracked corn, rolled barley, or brown rice to prepare treated bait. Poultry pellets and rolled barley are generally well accepted by starlings and cracked corn and brown rice by blackbird species. Bait grains from other grains may be used if they are shown to be acceptable to the target species. Bait grains should be mixed with untreated materials to be palatable to the target species, and to be likely to have minimal non-target risks which would be detrimental to other than those for poultry pellets, cracked corn, rolled barley or brown rice.

NOTE: WHEN CONTROLLING BLACKBIRDS, GRACKLES, STARLINGS, COWBIRDS CROWS, AND JAYS IT MAY BE NECESSARY TO OBTAIN A PERMIT FROM THE APPLICABLE STATE WILDLIFE AGENCY.

SEE RIGHT SIDE FOR ADDITIONAL DIRECTIONS FOR USE

RESTRICTED USE PESTICIDE

DUE TO HIGH ACUTE TOXICITY TO BIRDS

For retail sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicators certification.

For use only by U.S. Department of Agriculture personnel trained in bird control or persons under their direct supervision.

COMPOUND DRC-1339 CONCENTRATE-STAGING AREAS

For bird control in non-crop staging areas associated with ~~poor~~

ACTIVE INGREDIENT:	
3-Chloro-4-methylbenzoxazinyl hydrochloride	98.0%
INERT INGREDIENTS	2.0%
TOTAL	100.0%

KEEP OUT OF REACH OF CHILDREN

DANGER — POISON

STATEMENT OF PHYSICAL TREATMENT

IF SWALLOWED: CALL A PHYSICIAN OR POISON CONTROL CENTER IMMEDIATELY!

IF SWALLOWED: Induce vomiting and immediately call a physician.

IF INHALED: Move patient from contaminated area and immediately call a physician.

IF ON SKIN OR IN EYES: Immediately flush eyes or skin with large quantities of water. Call a physician immediately.

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
Hyattsville, MD 20782
EPA Reg. No. 56228-30
EPA Est. No. 56228-ID-1

Net Weight

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

STORAGE: Store only in original container in a dry place inaccessible to children, pets and livestock.

PESTICIDE DISPOSAL: Pesticide should not be casually incinerated. Improper disposal of empty containers, such as by burning, or dumping in a body of water, may result in the release of toxic vapors or liquids. Empty containers should be triple-rinsed, then disposed of in a sanitary landfill or by other means approved by State and local authorities. If incinerated, any residue should be disposed of in a sanitary landfill.

CONTAINER DISPOSAL: Completely empty by shaking and tapping and then by burning in a sanitary landfill. Empty containers should be triple-rinsed, then disposed of in a sanitary landfill or by other means approved by State and local authorities. If incinerated, any residue should be disposed of in a sanitary landfill.

DIRECTIONS FOR USE (Cont.)

USE RESTRICTIONS

Use this product to prepare baits to control the pest birds indicated below, in "staging" areas associated with high time roosting sites. "Staging" areas where birds may be staged include stubble fields, harvested but fields, open grassy or bare-ground noncrop areas, pastures, food tips, industrial and commercial structures, and secured parking areas.

DO NOT apply bait in any way that could contaminate food or feed crops or that could be ingested by livestock.

DO NOT apply baits where there is a danger of contamination by Endangered or Threatened Species.

DO NOT harvest any crops for use as food or feed or allow livestock to graze in treated fields for one year following application of the pesticide in any area.

Target Species

- Belted tit (Otocoris naja)
- Brown-headed cowbird (Molothrus ater)
- Common grackle (Quiscalus quiscula)
- Grackled grackle (Quiscalus quiscula)
- Red-winged blackbird (Agelaius phoeniceus)
- Starling (Sturnus vulgaris)

When in mixed flocks with one or more of the species listed above, the following species also shall be considered to be target species: Common crow (Corvus brachyrhynchos), Black-billed magpie (Pica pica), Brewer's blackbird (Euphagus cyanocephalus), Blue jay (Cyanus cristatus), Red-shouldered hawk (Bubo virginianus), Tricolored blackbird (Agelaius tricolor), and Yellow-headed blackbird (Xanthocephalus xanthocephalus).

SEE REVERSE SIDE FOR ADDITIONAL DIRECTIONS FOR USE

DIRECTIONS FOR USE (Cont.) USE RESTRICTIONS (Cont.)

Before applying treated bait, observe target populations of birds thoroughly to determine their relative numbers, feeding habits, and preferred "staging" areas. Once potential "staging" areas are located, they must be observed to determine the relative abundance of nontarget species and prebaited with untreated bait to promote bait acceptance by target species.

PREBAITING

After daily activity patterns of birds have been noted and appropriate baiting location selected, apply untreated bait material of the type that will be used for the treatment within "staging" areas using the selected method of application at the rate given in APPLICATION DIRECTIONS below. Prebait for 1-2 weeks or until prebait is generally well accepted. Change prebaiting locations if necessary to achieve good acceptance. DO NOT apply toxic bait at sites where prebait has not been accepted well or where nontarget species have been eating prebait.

FORMULATION DIRECTIONS

Screening bait material Prepare all baits for treatment by screening to remove small particles and dust. For cracked corn, screening through a U.S. Standard Sieve No. 5 onto a U.S. Standard Mesh No. 7 will result in uniform baits weighing from 20 to 80 mg (6,000 to 22,000 pellets/lb.). For brown rice poultry pellets, whole or rolled corn, and other baits, screening over a U.S. Standard Sieve No. 7 will result in approximately 4500 pellets or 1500 kernels/lb., respectively.

Mixing bait Dissolve Compound DRC-1339 Concentrate - Baiting Areas in an appropriate carrier and mix with the bait materials of choice as indicated below.

Cracked Corn or Rolled Barley (2% bait):
92 grams (3.2 oz) Compound DRC-1339
400 ml (14 oz) potable water
4.5 kg (10 lbs) rolled barley or cracked corn
Use binding agents, if needed.

Brown Rice (2% bait):
92 grams (3.2 oz) Compound DRC-1339
10 ml (0.3 oz) edible oil
30 ml (1 oz) Alcohol S
4.5 kg (10 lbs) brown rice

Poultry Pellets (1% bait):

46 grams (1.6 oz) Compound DRC-1339
400 ml (14 oz) potable water
4.5 kg (10 lbs) poultry pellets

Air dry baits at ambient temperature.

If pretreatment preference tests indicate that use of another grain material is warranted for baiting target birds, substitute the new grain material in the recipe above which resembles the selected bait substance in particle size and texture.

Dilution Dilute baits with untreated, similar grain materials to reduce the possibility that any target bird will ingest more than one toxic bait particle and to give more individuals of the target species opportunity to consume toxic bait particles. For the baits described above, the following dilution ratios are recommended:

Bait Material	Ratio of Treated to Untreated Particles
rolled barley, whole and corn poultry pellets	1:10 or more
cracked corn	1:25 or more

Stability Treated baits may be stored and used up to 30 days after preparation. Use diluted baits within 7 days. Baits that have been exposed to sunlight should be used immediately or disposed of as pesticide waste.

APPLICATION DIRECTIONS

Wear rubber gloves while handling baits. Where applicable, use a scoop for dispensing or broadcasting the baits.

Apply treated baits to "staging" areas where target birds have accepted prebait using one of the following methods:

1. **Hand Broadcast** Place up to 4.5 kg of bait in one or more reservoirs of broadcasters. Replace bait when it is 75% consumed, or after one week, or following 10 mm (0.4 in) of precipitation. Restore untreated bait at completion of treatment.

2. **Broadcast, mechanical** Broadcast bait using ground equipment or aircraft calibrated to deliver bait at a rate of 22 to 57 kg/ha (20 to 50 lb/acre) in swaths 6.5 to 17 m (20 to 50 feet) wide. Space treated swaths at least 6.5 to 17 m (20 to 50 feet) apart. Treated swaths may be retreated only once and only if 75% of baits previously applied have been consumed or following 10 mm (0.4 in) of precipitation. Previously untreated swaths may be treated, if necessary, after two treatments have been made to swaths originally treated and bait has been consumed or if 10 mm (0.4 in) of precipitation has fallen since the second treatment. DO NOT use aerial application in the vicinity of food or feed crops. DO NOT apply bait by any mechanical broadcasting method if there is any possibility that treated bait will land in areas

frequented by children or nontarget animals.

3. **Broadcast, manual** Wear protective gloves, manually broadcast bait at a rate of 0.5 kg/100 m² (1.1 lb/100 yards²) in swaths 6.5 to 17 m (20 to 50 feet) wide. Space treated swaths at least 6.5 to 17 m (20 to 50 feet) apart. Baited areas may be retreated once, or 75% of baits previously applied have been consumed, or following 10 mm (0.4 in) of precipitation. Previously untreated swaths may be treated at the completion of the treatment period.

Dispose of unused or spilled bait in accordance with the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and State laws by burial in an approved sanitary landfill or by incineration at an approved site if allowed by state and local authorities.